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OFFICE OF BUDGET AND FINANCE

VOLUME NO. 1

EXPLANATORY NOTES

OF

INCREASES, DECREASES, AND CHANGES IN LANGUAGE

IN THE BUDGET FOR THE

DEPARTMENT OF AGRICULTURE

FOR THE

FISCAL YEAR ENDING JUNE 30, 1939

AND OF

WORK DONE UNDER EACH OF THE APPROPRIATION ITEMS

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Project Statements

Following the custom of previous years, for the sake of simplicity and avoidance of confusion, "Project Statements" as shown in this book in general are limited to a breakdown of funds appropriated or allotted directly to the Department of Agriculture and do not generally include funds transferred from other Departments or establishments, although the latter are included in the Budget expenditure schedules under the items involved.

The Project Statements printed in the formal Budget and reprinted in the Subcommittee Print include, in addition to the direct funds, projects dealing with funds transferred from other Departments -- for example, funds received from such agencies as the Navy Department or the Veterans' Administration, for the inspection of meats by the Bureau of Animal Industry, or the inspection of food and drug samples by the Food and Drug Administration. Where it is desired to examine a project statement which includes such transferred funds, therefore, reference should be made to the Project Statements in the Budget or to the Subcommittee Print.

DEPARTMENT OF AGRICULTURE

Budget Estimates for Fiscal Year 1939 Compared with Appropriations for 1938 (as of December 31, 1937)

Bureau and item	Appropriation, 1938	Budget estimate, 1939, compared with appropriations, 1938	
		Total estimate, 1939	Increase (+) or decrease (-)
Ordinary Activities:			
Office of the Secretary	(1) $810,265	$870,825	(2) + $60,560
Office of the Solicitor	(3) 219,240	219,240	- -
Office of Information	(4) 1,474,770	1,474,770	- -
Library	105,420	105,420	- -
Office of Experiment Stations . . .	231,046	228,980	- 2,066
Special Research Fund	1,200,000	1,200,000	- -
Extension Service	901,754	935,416	+ 33,662
Weather Bureau	4,703,049	5,220,000	+ 516,951
Bureau of Animal Industry:			
Eradicating tuberculosis and Bang's disease:			
Regular appropriation	1,603,000	1,603,000	- -
Special appropriation (reappropriation)	(5) 15,864,000	(5) 6,600,000	- 9,264,000
All other work of Bureau	(6) 8,775,098	(6) 8,740,923	- 34,175
Total, Bureau of Animal Industry	26,242,098	16,943,923	- 9,298,175
Bureau of Dairy Industry	703,694	723,615	+ 19,921
Bureau of Plant Industry	4,809,048	4,621,675	-187,373
Forest Service	(7) 14,087,196	14,195,400	+ 108,204
Bureau of Chemistry and Soils . . .	1,425,431	1,430,000	+ 4,569
Bureau of Entomology and Plant Quarantine.	5,711,398	5,503,367	- 208,031
Bureau of Biological Survey	2,002,840	2,000,340	- 2,500
Bureau of Agricultural Engineering.	460,769	455,000	- 5,769
Bureau of Agricultural Economics .	6,212,698	6,368,683	+ 155,985
Bureau of Home Economics	245,085	243,085	- 2,000
Commodity Exchange Administration .	500,000	600,000	+ 100,000
Food and Drug Administration. . . .	2,227,758	2,327,758	+ 100,000
Soil Conservation Service	(8) 23,965,645	23,525,000	- 440,645
Beltsville Research Center	75,000	85,000	+ 10,000
Total, Ordinary Activities . . .	98,314,204	89,277,497	- 9,036,707

Bureau and item	Appropriation, 1938	Budget estimate, 1939, compared with appropriations, 1938: Total estimate, 1939	Increase (+) or decrease (-)
Special Items:			
Cooperative farm forestry (Act of May 18, 1937):			
Extension Service	- -	$100,000	+ $100,000
Forest Service	- -	1,200,000	+ 1,200,000
Incipient and emergency outbreaks of plant pests (Act of April 6, 1937)	$1,000,000	2,000,000	+ 1,000,000
Acquisition of lands for national forests	3,000,000	1,000,000	- 2,000,000
Migratory bird conservation fund .	600,000	600,000	- -
Private forestry cooperation . . .	- -	200,000	+ 200,000
Sugar laboratory, Houma, La. . . .	100,000	- -	- 100,000
Flood control surveys (transfer from War Department)	500,000	500,000	- -
Total, Special Items	5,200,000	5,600,000	+ 400,000
Receipts and Contributed Funds:			
Forest Service:			
Acquisition of lands in Uinta and Wasatch National Forests. . . .	50,000	50,000	- -
Payments to States and Territories	1,200,000	1,275,000	+ 75,000
Payments to school funds, Arizona and New Mexico.	30,000	30,000	- -
Roads and trails for States . . .	400,000	510,000	+ 110,000
Cooperative work (contributed funds)	1,000,000	1,000,000	- -
Bureau of Biological Survey:			
Payments to counties under Migratory Bird Conservation Act. . .	7,900	7,900	- -
Total, Receipts and Contributed Funds.	2,687,900	2,872,900	+ 185,000
Payments to States (exclusive of road funds and receipt funds):			
Agricultural experiment stations	6,232,500	6,250,000	+ 17,500
Agricultural extension work . . .	17,490,083	17,935,583	+ 445,500
Cooperative forest-fire prevention	1,655,007	1,655,007	- -
Cooperative distribution of forest planting stock.	70,579	100,000	+ 29,421
Federal-aid to States in wildlife restoration projects	- -	1,000,000	+ 1,000,000
Total, Payments to States, as above	25,448,169	26,940,590	+ 1,492,421

Bureau and item	Appropriation, 1938	Budget estimate, 1939, compared with appropriations, 1938: Total estimate, 1939	Increase (+) or decrease (-)
Bankhead-Jones Farm Tenant Act:			
Farm Security Administration:			
Farm tenancy (loans) (Title I). . .	$10,000,000	$15,000,000	+$5,000,000
Liquidation and management of resettlement projects (Title IV) . . .	- -	2,000,000	+2,000,000
Bureau of Agricultural Economics:			
Land utilization and retirement of submarginal land (Title III). . .	10,000,000	10,000,000	- -
Total, Bankhead-Jones Farm Tenant Act.	20,000,000	27,000,000	+7,000,000
Total, all foregoing items	151,650,273	151,690,987	+40,714
Agricultural Adjustment Administration:			
Conservation and use of agricultural land resources:			
Direct appropriation.	340,000,000	330,000,000	-10,000,000
Reappropriation - 1937 funds made available by Section 32, Act of August 24, 1935	92,978,552	- -	-92,978,552
Transfer from 1938 funds under Section 32, Act of Aug. 24,1935	17,021,448	- -	-17,021,448
Reappropriation from unexpended balance of funds provided by Section 12a, Act of May 12, 1933	50,000,000	- -	-50,000,000
Reappropriation from unobligated balances of funds provided by Section 12a, Act of May 12, 1933 and "Payments for agricultural adjustment" (1936).	- -	110,000,000	+110,000,000
Total, Conservation and use of agricultural land resources. . .	500,000,000	440,000,000	-60,000,000
Exportation and domestic consumption of agricultural commodities (Section 32, Act of Aug. 24, 1935)	125,097,214	147,000,000	+38,924,234
Transferred to "Conservation and use of agricultural land resources".	17,021,448		
Sugar Act of 1937 (Sept. 1, 1937) . .	250,000	48,000,000	+47,750,000
Total, Agricultural Adjustment Administration	608,325,766	635,000,000	+26,674,234

Bureau and item	Appropriation, 1938	Budget estimate, 1939, compared with appropriations, 1938	
		Total estimate, 1939	Increase(+) or decrease(-)
Road Funds (under General Public Works Estimates, 1939, for work administered by the Department of Agriculture):			
Federal-aid highway system.	$150,000,000	$63,000,000	-$87,000,000
Federal-aid secondary or feeder roads	5,000,000	10,000,000	+ 5,000,000
Elimination of grade crossings. . .	10,000,000	20,000,000	+10,000,000
Public-lands highways	2,500,000	- -	- 2,500,000
Forest roads and trails	12,500,000	7,000,000	- 5,500,000
Total, Road Funds.	180,000,000	100,000,000	- 80,000,000
TOTAL, DEPARTMENT OF AGRICULTURE, AS SHOWN IN BUDGET	(9)939,976,039	(10)886,690,987	- 53,285,052
Deduct reappropriations and transfers included in the foregoing:			
Moving expenses, South Building (Office of the Secretary)	- 10,000	- -	+ 10,000
Eradicating tuberculosis and Bang's disease (Bureau of Animal Industry)	- 15,864,000	- 6,600,000	+ 9,264,000
Control of European fowl pest . . .	- 5,000	- 5,000	- -
Flood control surveys.	- 500,000	- 500,000	- -
Conservation and use of agricultural land resources.	- 142,978,552	- 110,000,000	+32,978,552
Total, reappropriations and transfers.	- 159,357,552	- 117,105,000	+42,252,552
TOTAL, DIRECT APPROPRIATIONS, DEPARTMENT OF AGRICULTURE.	780,618,487	769,585,987	- 11,032,500

(1) Includes $10,000 reappropriated by 1938 Agricultural Appropriation Act for moving into South Building; also $193,815 transferred from Soil Conservation Service and $15,000 transferred from Forest Service.
(2) Actual decrease of $1,940 in working fund for Office of Secretary (including increase of $8,060 in working fund, offset by $10,000 reduction for moving expenses); and increase of $62,500 by transfers from other bureaus for Office of Land Use Coordination.
(3) Includes $14,400 transferred from Forest Service and $10,680 transferred from Soil Conservation Service.
(4) Includes $220,640 transferred from Soil Conservation Service.
(5) Reappropriated by the 1938 Agricultural Appropriation Act and estimated reappropriation for 1939.
(6) Includes $5,000 reappropriated by the 1938 Agricultural Appropriation Act for control of European fowl pest and estimated reappropriation of same amount for 1939.
(7) Excludes $15,000 transferred to Office of the Secretary, and $14,400 transferred to Office of the Solicitor.
(8) Excludes $193,815 transferred to Office of the Secretary, $10,680 transferred to Office of the Solicitor, and $220,640 transferred to Office of Information.
(9) Includes $180,000,000 for public highways included in General Public Works Program and $500,000 transferred from War Department for flood-control surveys
(10) Includes $100,000,000 for public highways included in General Public Works Program and $500,000 transferred from War Department for flood-control surveys.

OFFICE OF THE SECRETARY

(a) SALARIES, OFFICE OF THE SECRETARY

Appropriation Act, 1938	$452,700
Allotment from "General Administrative Expenses," Soil Conservation Service (for salaries covering personnel employed to handle additional departmental services occasioned by establishment of Soil Conservation Service in the Department of Agriculture).....	+57,160 (1)
Allotment from Soil Conservation Service (General Administrative Expenses, $3,105; Soil and Moisture Conservation and Land-use Investigations, $4,500; and Soil and Moisture Conservation Operations, Demonstrations, and Information, $1,395) for reimbursing Department of the Interior for guarding rented quarters in Washington, D.C.	+9,000 (2)
Available, 1938	518,860
Budget Estimate, 1939	581,920
Increase (apparent, $60,000; actual, $3,060)	63,060

(1) The 1939 estimates contemplate the transfer to this appropriation item, with a corresponding reduction in the appropriation for "Salaries and Expenses, Soil Conservation Service, General Administrative Expenses," of $57,160 for the salaries of employees engaged in departmental services, such as personnel, budget and finance, general operations, etc. As pointed out in previous years, during 1937 and 1938 these expenses have been met directly from the appropriations of the Soil Conservation Service, pending determination of the amounts required for departmental services arising out of the establishment of the Soil Conservation Service in the Department of Agriculture. The positions transferred and offices involved are listed in detail in Table I, which follows.

(2) The 1939 estimates also provide for the transfer to the "Rent of Buildings" appropriation of the Office of the Secretary from appropriations of the Soil Conservation Service of funds required for the rental of quarters for that organization in the District of Columbia. Upon request by the Department of Agriculture, the Interior Department arranges for the guarding of rented buildings occupied by the Soil Conservation Service, the cost being reimbursed to the National Park Service. In order to provide for such reimbursement, the transfer to the appropriation for "Salaries, Office of the Secretary" of $9,000, covering the estimated cost of such service for 1939, is recommended.

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Increase
1. General administration (including offices of the Secretary, Under Secretary, and Assistant Secretary).....	$66,202	$73,880	$73,880	-----
2. Personnel administration and service (including divisions of appointments, salary classification, investigations, and safety).....	100,374	127,420	127,420	-----
3. Budget and finance administration and service (including divisions of accounts, estimates and reports, purchase, sales and traffic, and bureau accounting service).....	164,009	192,780	192,780	-----
4. General operations (including real estate and housing, mails and files, telegraph and telephones, property, emergency rooms, post office, labor force, etc.).....	111,725	115,780	118,840	+ $3,060(1)
5. Land-use coordination (departmental coordination of all land-use surveys, planning, policies, and programs, including soil conservation, erosion control, rural rehabilitation, flood control, land utilization and purchase, submarginal land, water facilities in the arid and semi-arid States, and related programs).....	-----	-----	60,000	+ 60,000(2)
Reimbursement to National Park Service, Department of the Interior, for guarding rented quarters in Washington, D.C..	9,153	9,000	9,000	-----
Unobligated balance.....	705	-----	-----	-----
Total appropriation.....	452,168(a)	518,860(b)	581,920	+ 63,060

(a) 1937 obligations include allotments of $1,525 from "Salaries and Expenses, Forest Service," and $27,372 from "Salaries and Expenses, Soil Conservation Service," and excludes $9,000 allotted to "Salaries and Expenses, Extension Service." All these items either were transferred in the Agricultural Appropriation Act for 1938 or are transferred in the estimates for 1939.

(b) Includes $66,160 allotment from Soil Conservation Service - transferred in estimates for 1939.

The increase of $63,060 in this item consists of an actual increase of $3,060 and an apparent increase of $60,000, as follows:

(1) An actual increase of $3,060 for additional assistance in the Division of Operation, including:

(a) $1,800 for an additional clerk for the real estate section. This section handles matters connected with the leasing of office, laboratory, storage, and other facilities, both in Washington and in the field, for the various bureaus of the Department. The work involves, among other things, the examination of bids, consideration of requests for the renewal of existing lease contracts, and other actions affecting quarters under lease by the Department, as well as the preparation of numerous reports required to be made to other Federal agencies concerning leased space. This office also obtains clearances of Department leases through the Procurement Division, Treasury Department. The work of this section increased during the fiscal year 1937 more than 34 percent over 1936, and the present staff is required to work under extreme pressure and to perform overtime service regularly in order to keep the work current. The services of an additional clerk, qualified to exercise initiative and independent judgment, are urgently needed to augment the present undermanned staff.

The increase in volume of work is indicated in the following statement, which shows the number of individual transactions handled during the fiscal years from 1934 to 1937:

	Number of Lease Transactions			
	F.Y.1934	F.Y.1935	F.Y.1936	F.Y.1937
Leases covering office, storage, and laboratory quarters	1,241	1,732	2,438	3,363
Rental of garage facilities	533	480	595	608
Lease amendments, terminations, supplemental agreements, etc.	134	95	246	478
Total	1,908	2,307	3,279	4,449

(b) $1,260 for an additional mail clerk for the Department Post Office. The concentration of the major portion of the Department's activities in the Administration Building and in the new South Building (the final portions of which have recently been completed and are now occupied) has resulted in an appreciable increase in the work and responsibility devolving upon the staff of the central Department Post Office. In addition to this concentration of offices and personnel, the rapid expansion of the activities of the Department, both regular and emergency, has been reflected in a constantly increasing volume of mail matter of all classes, both incoming, outgoing, and inter-bureau, which must be handled by the central Post Office staff.

An actual check of various classes of mail matter passing through the Post Office for a period of three months during the fiscal year 1937, compared with a similar check for the corresponding period of the fiscal year 1936, indicated the following increases in the volume of mail during 1937 over 1936:

	Number of Pieces			
	F.Y. 1936	F.Y. 1937	Increase F. Y. 1937	
Incoming Mail:	(3 months)	(3 months)	No. Pieces	Percent
First class	1,927,939	2,701,220	773,281	40.1
Printed matter	284,869	384,112	99,243	34.8
Registered	4,072	4,217	145	3.6
Insured	735	1,059	324	44.1
Special delivery	3,236	4,180	944	29.2
Parcel post	5,014	5,555	541	10.8
Total	2,225,865	3,100,343	874,478	39.3
Outgoing Mail:				
First class	531,397	991,684	460,287	86.6
Printed matter	306,512	556,941	250,429	81.7
Registered	4,261	4,368	107	2.5
Air mail	2,472	5,106	2,634	106.6
Special delivery	2,121	2,675	554	26.1
Parcel post	2,982	1,263	-1,719	-57.6
Foreign	7,551	10,928	3,377	44.7
Total	857,296	1,572,965	715,669	83.5
Inter-Office Communications	103,278	205,160	101,882	98.6
Grand total	3,186,439	4,878,468	1,692,029	53.1

While the foregoing figures clearly indicate the large increase in the volume of practically all classes of mail during the fiscal year 1937, the occupancy of the final portions of the South Building, which has taken place since this count was made, has resulted in a still further increase in the mail received, sorted, distributed, and dispatched by the Post Office staff. To meet this situation the services of at least one additional clerk are urgently needed.

(2) Apparent increase of $60,000 for salaries in the Office of Land Use Coordination, which the Secretary has designated to coordinate land-use planning, land policy, and land-survey activities as they relate to the work of the Department as a whole, in order to avoid duplication and to have related activities harmonize in achieving the land-use adjustments necessary to a permanent agriculture.

The apparent increase is offset by corresponding reductions in other appropriations, as follows:

Bureau of Agricultural Economics: Salaries and expenses, farm management and practice	$10,000
Bureau of Biological Survey: Salaries and expenses, maintenance of mammal and bird reservations	2,500
Extension Service: Salaries and expenses, farmers' cooperative demonstrations	2,500
Forest Service: Salaries and expenses, national forest administration	15,000
Soil Conservation Service: Salaries and expenses, soil and moisture conservation operations, demonstrations, and information	30,000
Total reduction in other appropriations.....	60,000*

*There is also an apparent increase of $2,500 in the appropriation "Miscellaneous Expenses, Department of Agriculture," which is offset by a decrease of $2,500 in the appropriation "Salaries and expenses, Soil Survey," Bureau of Chemistry and Soils, for general expenses of the Office of Land Use Coordination. These two apparent increases, totaling $62,500, constitute the amount necessary to finance a minimum staff on a permanent basis for land-use coordination. $62,500, while adequate to cover general departmental coordination in the land-use field, is insufficient to finance such coordination in relation to the following programs: Soil Conservation and Domestic Allotment, Tenancy, Rehabilitation, Land Utilization and Submarginal Land Purchases, Flood Control, and farm-to-market roads. Because of the fluctuating requirements of these programs and because the funds appropriated therefor may be allocated for coordination by the Secretary, the additional cost of coordination will be financed in this manner. Such allocations during the fiscal year 1939 probably will total not more than $45,000.

Need for Land-Use Coordination

The activities of the Department, including the action programs, are administered partly by new agencies created within the past few years and partly by the older branches of the Department. None of the activities, however, can be administered wholly independently of the others.

The Department has always found it necessary to provide for departmental consideration and coordination of bureau activities. Thus it has long had means for coordinating research, extension, information,

fiscal, and personnel work. But the new functions and added responsibilities which have been placed upon the Department in the past few years have proved these earlier means to be inadequate for developing and carrying forward an integrated program directed toward putting land to its best use.

The land-use objectives of the Department as a whole are to promote:

(1) Stability and efficiency of farm production.

(2) Stability of natural resources; conservation of soil, moisture, and fertility; flood control; conservation of forests, range, and wildlife.

(3) Stability of farm prices, income, and a proper rural-urban balance.

(4) Security of tenure: A higher percentage of farmers owning their own land, and a better tenure system for those who continue as tenants.

(5) Higher standards of rural living and stability of rural communities, governments, and regions, through better land use.

Many parts of the Department contribute substantially toward the achievement of these objectives:

The Agricultural Adjustment Administration promotes a conservation type of farming and price stability.

The Soil Conservation Service, by research, demonstration, and other means, aids farmers and public agencies in controlling erosion and in conserving water.

The Forest Service aids in putting land to its best use by promoting farm forestry, developing and managing public forest and range lands, and promoting the proper use of private forest and range lands.

The Bureau of Agricultural Economics is responsible for the economic phases of land-use planning, both in research and survey work, and manages the submarginal-land retirement program so as to promote better land use.

The Bureau of Chemistry and Soils classifies, correlates, and maps the soils of the United States, this scientific information being basic to all production and conservational programs, and the other research bureaus similarly develop and make available necessary basic information.

The Farm Security Administration aids tenants to become farm owners and, through rehabilitation loans based on farm-management plans, helps underprivileged farmers work toward a self-supporting basis.

The Bureau of Biological Survey manages wildlife refuges and promotes wildlife conservation on farms and public lands.

A number of bureaus--especially the Soil Conservation Service, Forest Service, and Bureau of Agricultural Economics--participate in flood-control survey activities under the Flood Control Act of 1936, and the plans developed from such surveys, if adopted by Congress, will promote proper land use on a watershed basis as an important aid to controlling floods.

The extension and information programs provide farmers with the information they need in the wise management of their land and farm operations. Disease and insect control work may greatly affect land use, as do the drainage, agricultural engineering, and other activities of the Department.

There is no practical way in which the Department of Agriculture could be organized to achieve the objectives set forth above that would not require coordination. Definite responsibilities must be assigned to each part of the Department but these responsibilities can not be exercised independently of the work managed by other parts of the Department. For example: An erosion control program, concerned primarily with physical changes on each farm, must be in harmony with the general agricultural conservation program, largely economic in character, which seeks to promote a conservational, as contrasted to an exploitive, system of farming. The rehabilitation program must not induce farmers to undertake work on their farms which would conflict with what the erosion-control and agricultural conservation programs are trying to accomplish. And it would be contrary to sound public policy if any of these three programs made heavy expenditures in a submarginal land area which clearly ought to be retired from cultivation. In short, in any given area, every effort of the Department must be in harmony with its total effort to promote the maximum and wise use of the farm resources of that area.

Considering the magnitude of the Department's job, there has been a surprisingly small amount of duplication and working at cross purposes. But of course there has been some. Consequently, all branches of the Department concerned with land-use activities, after detailed study of the problem, recommended that the Secretary establish a central office for the coordination of land-use planning, land policy, and land-survey activities as a part of the Office of the Secretary. During the current fiscal year this coordination is being handled as well as may be possible through the temporary loan of personnel available in the bureaus. For 1939 and thereafter, however, it is essential that provision for an Office of Land Use Coordination be included in the budget of the Office of the Secretary. It is possible to make corresponding reductions in appropriations affecting the various interested bureaus, these reductions proportioned approximately as these bureaus will benefit from the coordinating activities. However, funds available for the administration of the Soil Conservation and Domestic Allotment Act, the Federal Aid Highway program, the Farm Tenancy program, the Rehabilitation program, flood control, and the submarginal-land retirement program, cannot

readily be handled in this way, and consequently the Secretary will allocate each year from these funds such proportionate amounts as will be absolutely essential for departmental coordination.

Functions of Office of Land-Use Coordination

The new office will consist primarily of a Coordinator, a small technical staff, and necessary clerical assistance. The Coordinator will be assisted by a Board consisting of liaison representatives from each of the bureaus concerned. These representatives will devote such time as may be necessary in helping coordinate activities, in formulating broad policies, and in insuring that such policies are carried out by the respective bureaus. The duties of the new office will be:

(1) Represent the Secretary in coordinating the land-use activities of the Department.

(2) Coordinate land acquisition projects, including submarginal-land acquisition under Title III of the Bankhead-Jones Farm Tenant Act.

(3) Have general supervision of the Department's flood-control program and coordinate the activities of bureaus participating in the flood-control program under the Omnibus Flood Control Act of 1936.

(4) Review, coordinate, and establish uniform standards for all survey work relating to land use, including: Aerial photography, soil surveys, erosion surveys, flood-control surveys, land-use surveys, and forest surveys; establish a system for advance clearance for survey projects which will eliminate duplication and insure that surveys meet the needs of all agencies, especially the action agencies.

(5) Represent the Department on the National Resources Committee in all matters that have to do with land-use planning; on the Agriculture - Farm Credit, and other interdepartmental committees.

(6) Cooperate with the Director of Research and chiefs of bureaus in coordinating land-use research with the survey and planning work of the Department.

(7) Cooperate with heads of action agencies in coordinating basic land-use policies and programs and assist such action agencies in cooperating with State and local agencies in developing practical land-use plans on a county, watershed, or other basis, which will serve as the criteria for an integrated program in such areas.

The general functions outlined above may be stated more specifically by the use of examples.

Coordination, to be successful, must be systematic and continuous. It is not possible simply haphazardly to direct a coordination of programs and policies. It is necessary to establish definite methods of

coordination. These break down into about five general phases: (1) Survey phase -- many plans, programs, and policies are based on information developed by the physical and economic surveys; (2) planning phase -- basic parts of comprehensive land-use plans are usually contributed by more than one agency; (3) policy and program phase -- the action programs are based upon the physical, economic, and other data acquired in research, survey, and planning work; (4) organization phase; (5) legal phase.

Examples:

Coordination of Surveys: The Soil Survey acquires fundamental scientific information regarding the soils of the United States, information which is basic to all phases of agricultural research and action. An erosion survey is an inventory of the physical factors on which a soil and moisture conservation program is based; among other factors surveyed are slope, susceptibility of the soil to erosion, degree of erosion, and present land use. By coordinating the two types of surveys the Soil Conservation Service obtains the experienced assistance of the soil-survey specialists in classifying and correlating the soils and the Bureau of Chemistry and Soils in turn may use the information thus developed in its regular soil-survey program. The information on physical factors acquired in both these surveys is also essential in preparing the flood-control reports which are called for under the Omnibus Flood Control Act of 1936, but here surveys from the economic and social point of view are also essential. Therefore by coordinating soil surveys, erosion surveys, and flood-control surveys, the job for each may be simplified and the results may serve many purposes and programs. To accomplish this will require uniform standards and a system of advance scheduling and clearance.

Coordination of Land-Use Plans: In the Department the basic information essential to comprehensive land-use planning is developed by the Forest Service, the Bureau of Agricultural Economics, the Soil Conservation Service, the Bureau of Chemistry and Soils, the Agricultural Adjustment Administration, the Bureau of Plant Industry, the Bureau of Animal Industry, and other agencies. While one agency may have to synthesize all the factors in developing a plan for a specific purpose, it is necessary to make sure that each factor has been given its proper weight. Thus, a comprehensive flood-control plan for a given watershed, required by the Act of 1936, may be prepared by the Soil Conservation Service, with the help of the Bureau of Agricultural Economics and the Forest Service. But such plan, before submission to Congress, must be considered by the Department as a whole to determine the relationship of the proposed plan to the program of the Agricultural Adjustment Administration, which makes payments within the watershed for specific land-use practices, and to the tendency and rehabilitation programs. In short, a flood-control plan for any watershed must harmonize with the Department's total land-use objective for the area; if this is not true, the two things must be brought into harmony.

Coordination of Land-Use Policies and Programs: Everyone now realizes the seriousness of the situation in the Great Plains, which

was made the subject of a special President's committee report. Clearly, solution requires a continuously coordinated attack by all of the land-use agencies. But we have many other areas where bad land use has resulted in a serious breakdown in the whole economy. For example, the old Plantation Piedmont in the Southeast was once a stable, highly productive, cotton-producing section. Now much of it has been ruined by the boll weevil and by erosion. Thousands of families have left. Farms have been abandoned. Foreclosures have been heavy and tax delinquency serious. Tenancy is widespread. Solution of the problem is not a simple matter. It cannot be solved simply by demonstrating proper farm practices. Nor can it be solved simply by making benefit payments or rehabilitation loans. What is called for is a program in which all these things and others, too, function together, with all of them directed toward readjustments which must be made permanent by the farmers themselves. The type of farming requires change. Submarginal land must be purchased. Tenants need to be helped to ownership. Perhaps work under the Farm Forestry Act will be required. Payments under the Soil Conservation and Domestic Allotment Act should be used to the fullest possible extent to encourage the shifting of the most highly erosive land into trees and vegetative cover; on the land which can be used for cultivation, payments should encourage the use of soil-conserving practices. Rehabilitation loans should be contingent upon the adoption by farmers of sound farm management and land-use plans. The Soil Conservation Service must give technical help to farmers who must strip-crop, contour-plow, terrace, and use other practices that will decrease the ravages of water erosion. There needs to be adoption of regulations under State Soil Conservation District laws, rural zoning laws, possibly changes in the system of assessment and taxation, and in other State legislation. All information which will enable County Agricultural Planning Committees to classify land must be furnished. State agencies must do their part. This type of coordination in programs and policies is essential if we are to achieve permanent adjustment in the Southeast.

Nor is the necessity for more effective coordination in land use confined to the Department itself. A coordinated inter-departmental attack is needed to bring about the permanent adjustments required in many areas. For example, a critical situation has developed in the Upper Rio Grande watershed. Here a large Indian and Spanish-American population promises to become a permanent relief burden because of a progressive loss of soil resources through bad land use. Between 1880 and 1937, 40,000 acres out of a total of 135,000 acres of formerly productive, irrigated land have been ruined for use by the silting of the river bed, seepage and floods resulting from over-grazing and erosion in the watershed above. The bed of the river has been raised 12 feet, and an entire town has been practically buried under silt and sand. The Middle Rio Grande Conservancy District, heavily financed by the Federal Government through the Reconstruction Finance Corporation, is threatened with default. Deterioration and destruction of the grazing resources in the watershed is proceeding at an alarming rate because of overstocking and lack of conservational measures. Federally owned lands are interspersed with State, railroad, and privately owned range lands, making conservational control difficult. Federal relief has been heavy. Here effective coordination between three bureaus of

the Department of Agriculture and three bureaus of the Department of the Interior is essential. The cooperation of the Reconstruction Finance Corporation and the Farm Credit Administration is also essential. Effective Department of Agriculture coordination can best be achieved through a central coordinating office.

Coordination in Procedure and Organization: Efficient coordination in the land-use field may involve changes in organization and procedure. For example, to unify the economic phases of land-use planning, the Secretary on September 1 transferred the land planning, acquisition, and development work of the Farm Security Administration to the Bureau of Agricultural Economics. This brought together the work in farm management, land economics, land-use planning, and public finance, all of which are necessary in developing a comprehensive program of land utilization, in planning submarginal land purchases, and in providing economic assistance to action programs, such as soil conservation. A study is now under way to determine how to improve Federal-State cooperation in all survey and planning work, and State consultation in matters involving programs and policies.

Coordination -- Legal Phase: All that the Department does in the land-use field is authorized in Federal legislation. Innumerable State laws deal with land use. Duplication and working at cross-purposes can often be avoided by considering all new legislation, on which the advice of the Department is requested, in the light of existing authority, and by a systematic study of present law with a view to requesting amendments where conflict clearly is attributable to legislation. In addition, whenever specific coordinations of surveys, plans, policies, programs, or administrative agencies are proposed, the statutes under which the present activities are being carried on must be examined and interpreted, so that the coordination will be within the provisions of law, or so that the appropriate amendments to existing law may be recommended to Congress.

Coordination in the Dust Bowl

While the Department has not included in these estimates an amount for a coordinating staff in the Dust Bowl, a brief explanation is included here for the information of the Committee.

The critical situation in the Dust Bowl has become a problem of serious national importance. Solution can be neither simple nor rapid. Much land is too far gone for private enterprise to bring under control. This will have to be purchased and put under vegetative cover. On land retained in private ownership the Agricultural Adjustment Administration will need to emphasize retirement of land from cultivation and encourage its return to grass through the process of natural restoration. The continuation of the Rehabilitation Program is essential during the reconstruction period, but this program must be applied to bring about better land use on individual farm units. Efforts must be made to enable farmers who should remain in the area to lease or otherwise obtain larger farm operating units to permit more range livestock

production, with less dependence upon cash grain production. The assistance of the Soil Conservation Service is essential, both in bringing about the adoption and use of soil-conserving practices on the lands to remain in private ownership, and in the application of wind erosion-control measures on the land to be publicly acquired. Individual farm operators are now powerless to prevent the destructive blowing of soil onto their lands from their neighbors'. Soil Conservation Districts will need to be established and undoubtedly rural zoning and other types of land-use regulations will have to be adopted by the State. In some States the taxation system encourages exploitive use of lands. In some States, too, State lands are not under conservational control. Other States follow the policy of reselling tax reverted lands as rapidly as possible regardless of the quality or character of the land. Schools, roads, and other facilities have been built and are being built where maintenance and support are financially impossible; settlement and cultivation are being encouraged where such should not exist.

The situation has grown so critical, and rapid, integrated action by all agencies is so urgent, that early in the summer of 1937 the Secretary of Agriculture, in response to urgent requests from the States involved, designated a Coordinator, with headquarters in the critical Dust Bowl area. This officer works closely with the regional officials of the various Departmental agencies, especially of the Agricultural Adjustment Administration, Farm Security Administration, and Soil Conservation Service. He examines plans for action developed by the bureaus and divisions and then recommends their approval or disapproval. In the field he is observing and appraising the operating effectiveness of the Department's programs. The Coordinator is also working with the several State Colleges and Extension Services, State Land Boards, and other State and local agencies, to the end that all efforts will be coordinated for effective action.

WORK UNDER THIS APPROPRIATION

General.--This appropriation provides for the salaries of employees of the Office of the Secretary of Agriculture, Under Secretary, Assistant Secretary, Office of Personnel, Office of Budget and Finance, Office of Land Use Coordination, and the Division of Operation, including such activities as land-use coordination, the appointment, salary classification, safety, and investigations divisions, the finance, accounting, purchases, sales, and traffic divisions, mail and files, telephone and telegraph, post office, emergency rooms, housing, building directory and information services, labor force, etc. This organization comprises the general administration and supervision of the work of the Department, as follows:

1. General Administration.--The Offices of the Secretary, Under Secretary, and Assistant Secretary exercise general supervision and control over the Department as a whole, and formulate, establish, and arrange for the carrying out of general policies affecting agriculture in the broadest sense.

2. Personnel Administration and Service.--The Office of Personnel is in charge of the personnel work of the Department. This office unifies methods of procedure and applications of policy in regard to personnel; advises with the several bureaus and offices on organization, job classification, placement, training, and procedure; maintains records, renders reports, and makes all contacts with other Government agencies on matters relating to personnel; investigates cases of delinquency among employees and recommends appropriate disciplinary action; interprets the regulations applying to leave and efficiency ratings; reviews proposed changes affecting the status of employees and recommends appropriate action to the Secretary; organizes and develops programs of safety education and elimination of accident hazards; and sponsors and promotes educational courses for employees, welfare activities, and other measures which may contribute to improve the general morale of the Department.

3. Budget and Finance Administration and Service.--The Office of Budget and Finance has general supervision over the fiscal business of the Department. It prepares, in cooperation with the bureaus, the annual budget for the Department; prepares reports on appropriations and expenditures; consults and advises with the bureaus on fiscal matters; maintains the uniform project system covering the program of work of the Department, and appropriation control and related accounts for the Department as a whole; maintains a Bureau Accounting Service for certain of the bureaus; and supervises and coordinates activities involving purchases, sales, and traffic within the Department. This office conducts the business of the Department with the Bureau of the Budget, the General Accounting Office, the Treasury Department, the Appropriations Committees, and other agencies of the Government concerned with fiscal and related matters.

4. General Operations.--The Division of Operation is responsible for the management of the buildings and other facilities occupied or used by the Department of Agriculture in the District of Columbia, the telephone and telegraph service, the mails and files, post office, emergency rooms, and motor-truck and other service units. The chief of this division also acts as real-estate officer of the Department and as personnel and administrative officer for the internal operation of the Office of the Secretary, and supervises, in addition to the above-mentioned activities, the work of the immediate office comprising real estate and housing, personnel, engineering advice, preparation of budget estimates for the Office of the Secretary, the labor group, and the building directory and information service.

5. Land-Use Coordination.--The Office of Land Use Coordination directs the coordination of land-use planning, land policy, and land-survey activities as they relate to the work of the Department as a whole, including (1) clearance of land acquisition projects, (2) general supervision of the Department's flood control program and flood control activities of participating bureaus, (3) establishment of uniform standards for all survey work relating to land use and clearance of proposed survey projects, (4) representation of the Department on the National Resources Committee,

(5) cooperation with the Director of Research and chiefs of bureaus in coordinating land-use research with the survey and planning work, and (6) cooperation with heads of action agencies in coordinating basic land-use policies and programs.

QUARTERS, HEAT, AND LIGHT ALLOWANCE AUTHORIZATIONS FOR 1939

No change is estimated in the amount of the proviso contained in the appropriation item for "Salaries, Office of the Secretary" which limits the total ($40,000) that may be paid from the several bureau appropriations applicable as allowances to officers and employees of the Department of Agriculture permanently stationed in foreign countries for living quarters, including heat, fuel, and light, under the provisions of the Act of June 26, 1930 (5 U.S.C. 118a).

The estimates of the four bureaus involved, on a per annum basis, for each of the fiscal years 1938 and 1939 are:

Agricultural Economics	$23,900
Animal Industry	1,400
Entomology and Plant Quarantine.....	10,100
Plant Industry	720
Departmental reserve authority for contingencies	3,880
	40,000

A detailed schedule of the allowance amounts for 1937 and 1938 and the estimated amounts for 1939 follows:

Schedule of Allowances for Quarters, Heat, and Light of Employees
Permanently Stationed Abroad Under Act of June 26, 1930.

Appropriation and subappropriation	Title of position	Post of duty	Classification of post	Domestic status	Group	Salary	Allowances		
							Estimated		Actual
							1939	1938	1937
Bureau of Agricultural Economics:									
Salaries and expenses:									
Foreign Competition and Demand	Agri. Attache	Belgrade, Yugo.	IV	M	2	$6,000	$1,500	$1,500	$1,433
	Agri. Attache	Berlin, Germany	V	M	2	6,200	1,700	1,700	1,700
	Asst. Agri.Attache	" "	V	M	3	4,000	1,500	1,500	1,500
	Agri. Commissioner	" "	V	M	2	5,800	1,600	1,600	1,600
	Agri. Commissioner	Bombay, India	V	M	2	-----	-----	-----	1,567
	Agri. Attache	Buenos Aires,Arg.	V	M	2	6,000	1,700	1,700	1,700
	Agri. Attache	London, England	V	M	2	6,000	1,700	1,700	1,700
	Asst. Agri.Attache	" "	V	M	3	4,800	1,500	1,500	1,500
	Agri. Commissioner	" "	V	M	2	6,000	1,600	1,600	1,600
	Agri. Commissioner	" "	V	M	2	6,000	1,600	1,600	1,600
	Prin. Mktg. Spec.	Manchester, Eng.	IV	M	2	6,000	1,500	1,500	817
	Agri. Attache	Paris, France	V	M	2	6,000	1,700	1,700	1,700
	Asst. Agri.Attache	" "	V	S	3	4,800	1,000	1,000	1,500
	Agri. Commissioner	Shanghai, China	V	M	2	6,000	1,700	1,700	1,700
	Asst. Agri. Comm.	Calcutta, India	V	M	3	4,600	1,500	1,500	1,500
	Asst. Agri. Comm.	Unassigned	-	-	-	3,800	-----	-----	-----
	Asst. Agri. Econ.	"	-	-	-	4,600	-----	-----	-----
	Agri. Attache	"	-	-	-	5,600	-----	-----	-----
	Agri. Commissioner	"	-	-	-	4,800	-----	-----	-----
	Reserve	-	-	-	-	-----	2,100	2,100	-----
Total, Bureau of Agricultural Economics						97,000	23,900	23,900	23,117
Bureau of Animal Industry:									
Salaries and expenses:									
Inspection and Quarantine	Sr. Veterinarian	London, England	V	M	2	4,600	1,400	1,400	1,400

Appropriation and subappropriation	Title of position	Post of duty	Classification of post	Domestic status	Group	Salary	Allowances Estimated 1939	Allowances Estimated 1938	Allowances Actual 1937
Bureau of Entomology and Plant Quarantine:									
Salaries and expenses:									
Fruit Insects	Prin. Entomologist	Mexico City, Mex.	V	M	2	$5,800	$720	$720	$720
	Senior "	" " "	V	M	3	4,600	720	720	720
	Assoc. "	" " "	V	M	3	3,200	720	720	720
	Assoc. "	" " "	V	M	3	3,200	720	720	---
	Asst. "	" " "	V	S	3	-----	---	---	500
	Asst. "	" " "	V	M	3	2,600	720	720	---
	Junior "	" " "	V	S	3	2,000	500	500	---
Foreign Parasite Introduction	Asst. "	Yokohama, Japan	IV	S	3	2,800	1,020	1,020	1,020
	Asst. "	" "	IV	S	3	2,600	1,020	1,020	---
	Entomologist	St.Cloud, France	V	M	2	4,400	1,200	1,200	883
	Entomologist	Hyeres, France	V	M	2	-----	---	---	195
	Assoc.Entomologist	St.Cloud, France	V	M	3	3,200	1,020	1,020	413
	Assoc. "	Hyeres, France	V	M	3	-----	---	---	180
	Assoc. "	St.Cloud, France	V	M	3	3,200	1,020	1,020	752
	Assoc. "	Hyeres, France	V	M	3	-----	---	---	180
Forest Insects	Assoc. "	Oxford, England	III	M	2	3,200	720	720	720
Cotton Insects	Asst. "	Tlahualilo, Mex.	I	M	3	-----	---	---	375
Total, Bureau of Entomology and Plant Quarantine						40,800	10,100	10,100	7,378
Bureau of Plant Industry:									
Salaries and expenses:									
Forest Pathology ...	Assoc. Pathologist	Oxford, England	III	M	2	3,200	720	720	---
Grand Total						145,600	36,120	36,120	31,895

(b) MISCELLANEOUS EXPENSES, DEPARTMENT OF AGRICULTURE

Appropriation Act, 1938	$105,750
Budget Estimate, 1939	108,250
Increase (apparent)	2,500

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Increase
Miscellaneous Expenses, Department of Agriculture.....	$102,100	$105,750	$108,250	+$2,500 (1)
Unobligated balance	18,648	-----	-----	-----
Total appropriation.....	120,748(a)	105,750(b)	108,250	+ 2,500 (1)

(a) Includes $7,000 estimated unobligated balance, 1937, continued available in 1938 for moving expenses in connection with occupancy of new South Building; excludes $25,000 transferred from Agricultural Adjustment Administration and $25,000 from Soil Conservation Service for increase in the inventory of the Central Supply Section, to provide for the additional volume of business occasioned by these units.

(b) Excludes $7,000 estimated unobligated balance, 1937, continued available in 1938 for moving expenses in connection with occupancy of new South Building.

INCREASES OR DECREASES

(1) An apparent increase of $2,500 is estimated for in this item, which is offset by a corresponding reduction in the appropriation for "Salaries and Expenses, Bureau of Chemistry and Soils, Soil Survey," to provide for general expenses of the Office of Land Use Coordination supplies, equipment, communication service, travel expenses, etc.), as explained under the item for "Salaries, Office of the Secretary."

CHANGES IN LANGUAGE

The estimates provide that the first section of the language of this paragraph be amended to read as follows:

For stationery, [blank books, twine, paper, gum, dry goods, soap, brushes, brooms, mats, oils, paints, glass, lumber, hardware, ice, furniture, carpets, and mattings; for] supplies, materials, and equipment, freight, express, and drayage charges, advertising and press clippings, [telegraphing, telephoning] communication service, postage, washing towels, repairs, and alterations;

This change constitutes a restatement of this section of the item, in order to describe more clearly and more accurately, by accounting classifications, the character of the objects and services procured thereunder and will eliminate an unnecessarily detailed, but still inadequate, itemization of supplies, materials, etc. No change is contemplated in the scope of the work now being done under this item.

The estimates also contemplate omission of the provision "together with not to exceed $10,000 of the unexpended balance of the appropriation for these purposes for the fiscal year 1937." This authorization was included in the 1938 Act in order to continue available for use during that fiscal year the unexpended balance of funds provided in the 1937 Act for moving expenses incident to the occupancy of the final portions of the Department's new South Building. These moving operations were concluded early in the fiscal year 1938 and the authorization may be omitted in 1939.

CHANGE IN PASSENGER AUTOMOBILE AUTHORIZATION

The estimates propose that the limitation placed upon the amount which may be expended for the replacement of one passenger-carrying vehicle be reduced from $2,500 (as provided in the 1938 Act) to $1,500 in 1939. This will provide for replacement of one of the automobiles now authorized under this item and which will need replacement during the fiscal year 1939, when it will have been in continuous operation for more than three years.

WORK UNDER THIS APPROPRIATION

This appropriation, as indicated by its terms, provides for a great variety of miscellaneous objects and services, including stationery, supplies, materials, and equipment, communication service, postage, freight, express, and drayage charges, laundry, repairs and alterations, advertising and press clippings, travel expenses, maintenance and operation of motor vehicles, and miscellaneous supplies and expenses not otherwise provided for and necessary for the practical and efficient work of the Department. It provides, also, for the compensation of the personnel of the Motor Transport Service and of such personnel of the Central Supply Section as are engaged in the procurement, storage, issue, and shipment of supplies and materials for the several bureaus of the Department, reimbursement being made to this appropriation from the funds of the bureaus for which service is rendered.

(c) RENT OF BUILDINGS IN THE DISTRICT OF COLUMBIA

Appropriation Act, 1938		$33,000
Allotments, 1938, from Soil Conservation Service, for rental of quarters in the District of Columbia for that Service, the appropriations of which are correspondingly reduced for 1939, as follows:		
"General administrative expenses"	$46,895	
"Soil and moisture conservation and land-use investigations"	19,170	
"Soil and moisture conservation operations, demonstrations, and information"	46,590	+112,655 (1)
Allotment, 1938, pursuant to the authorization in the Deficiency Resolution approved July 1, 1937 (Public No. 50, 75th Congress), from the appropriations indicated below, which have been reduced in corresponding amounts in the estimates for 1939, for the continuation of the rental of the Atlantic Building for the Forest Service, which was unable to vacate that building as planned because of the assignment to the Soil Conservation Service of space in the South Building originally intended for the Forest Service:		
"Soil and moisture conservation operations, demonstrations, and information, Soil Conservation Service"	15,000	
"National forest protection and management, Forest Service"	15,000	+ 30,000
Total available, 1938		175,655
Budget Estimate, 1939		180,655
Increase		5,000

(1) As explained under the item for "Salaries, Office of the Secretary" (see page 6 of these notes), the 1939 estimates provide for the transfer to the appropriation for "Rent of Buildings in the District of Columbia," with corresponding reductions in funds of the Soil Conservation Service, of amounts required for the rental of quarters for that organization in the District of Columbia and for which no space is available in Government-owned buildings. The rented space occupied by the Soil Conservation Service and the rentals involved are as follows:

Building and Location	Area (Sq.Ft.)	Annual Rental
Standard Oil (261 Constitution Ave. N.W.) ...	36,849	$68,171
Printcraft (930 H Street, N.W.)	22,795	22,795
Columbian (416 5th Street, N.W.)	12,530	17,095
Stewart (6th and D Streets, N.W.)	4,747	3,669
1653 Pennsylvania Ave., N.W.	804	925
Total	77,725	112,655

PROJECT STATEMENT

(For detailed tabulation of buildings and rentals see following page)

Projects	1937	1938 (Estimated)	1939 (Estimated)	Increase or Decrease
District of Columbia Rent Item, Agricultural Appropriation Act	$62,550	$33,000	$180,655	+$147,655
Allotments from Soil Conservation Service:				
"General administrative expenses"	41,123	46,895	-----	-46,895
"Soil and moisture conservation and land-use investigations".....	8,848	19,170	-----	-19,170
"Soil and moisture conservation operations, demonstrations, and information".....	21,207	46,590	------	-46,590
Allotments pursuant to authorization in Deficiency Resolution of July 1, 1937:				
"Soil and moisture conservation operations, demonstrations, and information, Soil Conservation Service".....	-----	15,000	-----	-15,000
"National forest protection and management, Forest Service".....	-----	15,000	-----	-15,000
Unobligated balance	450	-----	-----	-----
Total appropriation.....	134,178	175,655	180,655	5,000(1)

INCREASE

(1) The actual increase of $5,000 in this item is needed to provide for anticipated requirements under this appropriation during 1939 which will be explained verbally to the Committee on Appropriations.

WORK UNDER THIS APPROPRIATION

This appropriation provides funds for the rental of office, laboratory, and storage facilities for regular activities of the Department in the District of Columbia for which no quarters are available in Government-owned structures. In the following statement are shown the buildings and parts of buildings rented under this appropriation during the fiscal year 1937, and the estimated rentals for the fiscal years 1938 and 1939.

Statement Showing Estimated Rentals, Fiscal Years 1939, 1938, and 1937

Building and Location	Bureau Occupying Space	F.Y. 1939	F.Y. 1938	F.Y. 1937
Standard Oil (261 Constitution Ave.N.W.)	Soil Conservation Service	$68,171	$68,171(a)	$43,515(a)
Atlantic (928-930 F Street, N.W.)	Forest Service	30,000	30,000(b)	30,000
Printcraft (930 H Street, N.W.)	Soil Conservation Service	22,795	22,795(a)	17,635(a)
Columbian (416-5th Street, N.W.)	Soil Conservation Service	17,095	17,095(a)	18,349(a)
McKinley (American University)	Chemistry and Soils	12,800	12,800	12,800
Victor (724-9th Street, N.W.)	Forest Service.....	14,490(c)	14,490(c)	-----(d)
Stewart (6th and D Streets, N.W.)	Soil Conservation Service	3,669	3,669(a)	4,126(a)
1214-24th Street, N.W.	Weather	1,920	1,920	1,250(e)
2513 M Street, N.W.	Weather	1,000	1,000	1,000
1004 Eye Street, N.W.	Forest Service	-----	-----(d)	1,000
1653 Pennsylvania Ave. N.W.	Soil Conservation Service	925	925(a)	2,755(a)
Willard (513-515-14th Street, N.W.)	Public Roads	-----(f)	-----(f)	15,000
Howard (420-5th Street, N.W.)	Soil Conservation Service	-----	-----(g)	13,662(a)
Courts (6th St. and Indiana Ave. N.W.).	Soil Conservation Service	-----	-----(g)	8,400(a)
Appeals (426-5th Street, N.W.)	Soil Conservation Service	-----	-----(g)	2,972(a)
502-13th Street, N.W.	Soil Conservation Service	-----	-----(g)	1,748(a)
43 Capital Court, S.W.	Motor Transport Garage ..	-----	-----(g)	900
920 F Street, N.W. (basement)	Forest Service	-----(d)	-----(d)	600
Emergency rentals and reserve for reconditioning rented quarters upon relinquishment where required by terms of lease		7,790	2,790	450
		180,655	175,655	176,162
Deduct rentals included above paid from other appropriations, as shown on project statement, but estimated for 1939 under this head, with corresponding reductions in other appropriations affected		-------	-142,655	-113,162
Net, "Rent of Buildings" appropriation		180,655	33,000	63,000

(a) Rental paid from Soil Conservation Service funds.
(b) Rental paid from funds transferred from Forest Service ($15,000) and Soil Conservation Service ($15,000).
(c) Balance of rental ($14,143) paid by Forest Service from C.C.C. fund allotments.
(d) Rental paid by Forest Service from C.C.C. fund allotments.
(e) Rental for portion of fiscal year.
(f) Rental ($21,348) paid by Bureau of Public Roads beginning July 1, 1937.
(g) Quarters relinquished.

Statement showing buildings and parts of buildings rented in the District of Columbia other than those estimated for under the appropriation for "Rent of Buildings in the District of Columbia" (as of December 15, 1937).

Building and location	Bureau occupying space	Annual Rental rate
1437 K Street, N.W.	Agricultural Adjustment Administration	$15,494
Arlington Hotel (1025 Vermont Ave.,N.W.)	Farm Security Admin.	63,500
Barr (910 17th St., N.W.)	do.	39,306
Catlin (1324 New York Ave., N.W.)	do.	2,400
City Club (1320 G St., N.W.)	do.	43,990
Daily News (1322 New York Ave.,N.W.)	do.	18,000
Rizik (1737 L St.,N.W.)	do.	10,800
2214-16 M Street, N.W.	do.	6,960
1328 G Street, N.W.	do.	4,800
501 and 513 26th Street, N.W.	do.	6,300
Barber & Ross Warehouse (4th and Bryant Sts., N.E.)	do.	4,000
517 26th Street, N.W.	do.	1,800
Victor (724 9th St., N.W.)	Forest Service	14,143(a)
1004 Eye Street, N.W.	do.	1,000
920 F Street, N.W.	do.	600
Kellogg (1416 F Street, N.W.)	Public Roads	7,222
Lenox (1523 L St., N.W.)	do.	22,924
1415 K Street, N.W.	do.	8,061
1345 E Street, N.W.	do.	7,674
509 14th Street, N.W.	do.	6,000
Willard (513-515 14th St., NW.)	do.	21,348
Total		306,322

(a) Balance of rental ($14,490) paid from appropriation for "Rent of Buildings in the District of Columbia."

TABLE I

Statement of positions involved in transfer from "Salaries and Expenses, General Administration, Soil Conservation Service" to "Salaries, Office of the Secretary" in estimates for 1939, covering personnel employed to handle additional departmental services occasioned by establishment of Soil Conservation Service in Department of Agriculture.

Office	Designation	Grade	Salary
General Administration:			
Secretary's Office:			
	Principal Clerk	CAF-6	$2,300
Personnel Administration and Service:			
Director's Office:			
	Assistant Clerk	CAF-3	1,680
Division of Classification:			
	Junior Investigator	CAF-6	2,300
Division of Investigations:			
	Principal Investigator	CAF-11	3,800
	Senior Investigator	CAF-10	3,500
	Assistant Clerk-Stenographer	CAF-3	1,620
Division of Appointments:			
	Assistant Clerk	CAF-3	1,860
	Senior Typist	CAF-2	1,500
	Junior Clerk	CAF-2	1,500
	Junior Clerk (3 at $1,440 each)	CAF-2	4,320
	Senior Typist (2 at $1,440 each)	CAF-2	2,880
	Total, Personnel Administration and Service		24,960
Budget and Finance Administration and Service:			
Director's Office:			
	Assistant Clerk-Stenographer	CAF-3	1,680
Division of Accounts:			
	Clerk-Bookkeeper (2 at $1,800 each)	CAF-4	3,600
Division of Purchase and Sales:			
	Junior Administrative Assistant	CAF-7	2,600
	Assistant Clerk (2 at $1,620 each)	CAF-3	3,240
	Junior Clerk-Typist (3 at $1,440 each)	CAF-2	4,320
	Junior Clerk	CAF-2	1,440
	Senior Typist	CAF-2	1,440
	Under Operator	CAF-1	1,260
Traffic Section:			
	Assistant Clerk-Stenographer	CAF-3	1,620
	Junior Clerk-Typist (2 at $1,440 each)	CAF-2	2,880
	Total, Budget and Finance Administration		24,080
General Operations:			
Chief's Office:			
	Assistant Clerk	CAF-3	1,680
Secretary's File Room:			
	Assistant Messenger	CU-2	1,080
Telegraph and Telephone Section:			
	Telegrapher	CAF-4	1,800
	Telephone Operator	CAF-1	1,260
	Total, General Operations		5,820
	Total transferred (33 positions)		57,160

TABLE II

ALLOTMENTS OF AGRICULTURAL ADJUSTMENT ADMINISTRATION FUNDS

Projects	Obligated, 1937	Estimated obligations, 1938	Estimated obligations, 1939
Agricultural Adjustment Administration (Payments for Agricultural Adjustment, Tobacco, Cotton, and Potato Acts):			
Inspection and investigational work	$5,528	---	---
Conservation and Use of Agricultural Land Resources:			
Administrative, accounting, auditing, personnel, investigative, and miscellaneous services and expenses in connection with the conservation and use of agricultural land resources program	315,288	$389,310	$390,630
Miscellaneous expenses in connection with land use coordination under the conservation and use of agricultural land resources program.	---	5,000	5,000
Miscellaneous expenses in connection with coordination of departmental action programs in the Southern Great Plains area.	---	10,000	10,000
Total, Conservation and Use of Agricultural Land Resources	315,288	404,310	405,630
Total, Agricultural Adjustment Administration Funds	320,816	404,310	405,630

TABLE III

ALLOTMENTS OF EMERGENCY FUNDS

Projects	Obligated, 1937	Estimated obligations, 1938
Emergency Relief Appropriation Act of 1935:		
Salaries of personnel detailed from Soil Conservation Service to the Office of the Secretary	$30,540	---
Reimbursement to National Park Service, Department of the Interior, for guarding rented quarters in the District of Columbia	4,298	---
Rent of quarters for Soil Conservation Service in the District of Columbia	41,924	---
Total, Emergency Relief Appropriation Act of 1935	76,762	---
Emergency Relief Appropriation Act of 1936:		
Salaries of personnel detailed from Soil Conservation Service to the Office of the Secretary	2,285	---
National Industrial Recovery, Allotment to Interior, Soil-Erosion Prevention (transferred to Agriculture):		
Salaries of personnel Detailed from Soil Conservation Service to the Office of the Secretary	2,287	---
Rent of quarters for Soil Conservation Service in the District of Columbia	60	---
Total, National Industrial Recovery, Allotment to Interior, Soil Erosion Prevention (transferred to Agriculture)	2,347	---
National Industrial Recovery, Agriculture, Wildlife Refuges:		
Miscellaneous expenses for coordination of land use planning in connection with the acquisition, improvement, and development of wildlife refuges	---	$2,500
Public Works Administration, Allotment to Interior, Soil-Erosion Prevention (transferred to Agriculture):		
Salaries of personnel detailed from Soil Conservation Service to the Office of the Secretary	2,006	---

Projects	Obligated, 1937	Estimated obligations, 1938
Public Works Allotments (National Industrial Recovery Act):		
Central feed mill and granary at Beltsville (Md.) Research Center	$41,453	$8,547
Acquisition of additional land at Beltsville (Md.) Research Center and dismantling, moving, and/or repairing buildings situated thereon	---	20,000
Total, Public Works Allotments.	41,453	28,547
Total, Emergency Funds	124,853	31,047

OFFICE OF THE SOLICITOR

(a) SALARIES AND EXPENSES

Appropriation Act, 1938 . . . . . .$194,160
Allotments from:
"National Forest Administration",
Forest Service (salaries of three attorneys at Forest Service regional headquarters). . . . . +14,400(1)
"General Administrative Expenses",
Soil Conservation Service (salaries of two attorneys and three clerks).+10,680(1)

Available, 1938 . . . . . .$219,240
Budget Estimate, 1939 219,240

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
Legal advice and assistance.....	$201,238	$219,240	$219,240(1)
Unobligated balance.....	472	---	---
Total appropriation.....	201,710(*)	219,240	219,240(1)

(1) 1938 allotments of $14,400 from Forest Service and of $10,680 Soil Conservation Service, covering salaries of employees engaged in legal work incident thereto are transferred to this item in the estimates for 1939, and the estimates for the Forest Service and the Soil Conservation Service have been reduced by corresponding amounts.

(*) 1937 obligations include allotments of $9,417 from "National Forest Administration", Forest Service, and $3,492 from "General Administrative Expenses", Soil Conservation Service.

WORK UNDER THIS APPROPRIATION

The Office of the Solicitor is the law office of the Department in compliance with a statute providing that "the legal work of the Department of Agriculture shall be performed under the supervision and direction of the solicitor" (5 U.S.C. sec. 518). Among the duties performed by the office are advising the Secretary and other administrative officials on legal problems in connection with all phases of their duties; assisting in the preparation of proposed legislative bills, administrative rules and regulations, orders, and proclamations; drafting and examining contracts, deeds, leases, and other documents; examining evidence to determine whether there have been violations of acts administered by the Department and, in proper cases, recommending prosecution to the Attorney General; preparing pleadings and briefs in civil and criminal cases and equity proceeding involving the Department and laws administered by it, and cooperating with the Department of Justice in the handling of such litigation in the lower and appellate courts; representing the Depart-

ment as counsel in hearings before the Secretary; handling the contracts of the Department with other governmental agencies in legal matters; conducting administrative hearings under various acts administered by the Department; prosecuting applications for patents by Department employees where the subject of the patent is used in departmental work; examining titles to land authorized for purchase or on which loans will be made by the Department; considering and recommending appropriate disposal of claims for damage to property of the United States in the custody of the Department and claims against the Government for damage arising from operations of the Department.

AGRICULTURAL ADJUSTMENT ADMINISTRATION
ALLOTMENTS

Projects	Obligated, 1937	Estimated obligations, 1938	Estimated obligations, 1939
Agricultural Adjustment Administration (transferred to Office of the Solicitor):			
Salaries and Expenses: Legal work relating to Agricultural Adjustment Administration projects.....	$268,217	$123,660	$123,660
Conservation and Use of Agricultural Land Resources, Department of Agriculture:			
Legal work in connection with conservation and use of agricultural land resources program.....	98,160	273,520	273,520
Exportation and Domestic Consumption of Agricultural Commodities; Department of Agriculture:			
Legal work in connection with exportation and domestic consumption of agricultural commodities program.....	---	21,060	21,060
Total.....	366,377	418,240	418,240

EMERGENCY FUND ALLOTMENTS

Projects	Obligated, 1937	Estimated obligations, 1938
National Industrial Recovery, Agriculture, Wildlife Refuges:		
For legal services in connection with the acquisition of land for wildlife refuges	$72,700	$38,500
P. W. A. Allotment to Interior, Soil Erosion Prevention (Transfer to Agriculture) (Soil Conservation Service) (Transfer to Office of the Solicitor):		
For legal services in connection with Soil Conservation Service programs	437	- - -
National Industrial Recovery, Interior, Soil Erosion Prevention (Transfer to Agriculture) (Soil Conservation Service) (Transfer to Office of the Solicitor):		
For legal services in connection with Soil Conservation Service programs	437	- - -
Emergency Relief Appropriation Act of 1935:		
Legal services in connection with title examination, etc., related to forestry and wildlife land-acquisition projects	548,494	- - -
Legal services in connection with Soil Conservation Service programs	5,662	- - -
Total, Emergency Relief Appropriation Act of 1935	554,156	- - -
Emergency Relief, 1935, Emergency Conservation Work, Agriculture, Miscellaneous Projects:		
Legal services in connection with title examination, etc., related to acquisition of land projects	6,934	- - -
Emergency Relief Appropriation Act of 1936:		
Legal services in connection with title examination, etc., related to forest land acquisition projects	- - -	146,200
Legal services in connection with the Farm Security Administration	258,599	465,395
Legal services in connection with Soil Conservation Service programs	437	- - -
Total, Emergency Relief Appropriation Act of 1936	259,036	611,595
Total	893,700	650,095

OFFICE OF INFORMATION

(a) SALARIES AND EXPENSES

Appropriation Act, 1938.....	$366,480
Allotment from "Soil and moisture conservation operations, demonstrations, and information, which is reduced by a corresponding amount for 1939 Soil Conservation Service (for services in connection with printing and binding work performed for that bureau).....	+13,320
Total available, 1938.....	379,800
Budget Estimate, 1939.....	379,800

Projects	1937	1938 (Estimated)	1939 (Estimated)
1. General administration of Office of Information and of informational work of the Department...	$19,425	$19,300	$19,300
2. Business service, including mail and files.....	25,268	26,838	26,838
3. Publications preparation and control:			
(a) Editorial control and final preparation of manuscripts	28,978	32,580	32,580
(b) Preparation of Yearbook and special reports.....	10,454	11,980	11,980
(c) Indexing Department publications.....	9,057	9,082	9,082
(d) Preparation of illustrations for publications.....	20,237	19,460	19,460
(e) Photographic service for the Department.....	33,709	34,440	34,440
(f) Printing procurement.....	14,709	14,740	14,740
Total, Publications preparation and control.....	117,144	122,282	122,282
4. Distribution of agricultural information directly to the public:			
(a) Control of mailing lists for distribution work.....	9,734	9,500	9,500
(b) Handling Congressional and general-public requests for agricultural information....	52,166	56,480	56,480
Total, Distribution of agricultural information directly to the public.....	61,900	65,980	65,980

PROJECT STATEMENT - Continued.

Projects	1937	1938 (Estimated)	1939 (Estimated)
5. Preparation and distribution of agricultural information to the press	$31,304	$31,820	$31,820
6. Preparation and distribution of agricultural information by radio	29,860	31,140	31,140
7. Addressing, duplicating, and mailing service for the Department	78,719	82,440	82,440
Unobligated balance	3,562	- - -	- - -
Total appropriation	367,182 (a)	379,800	379,800

(a) 1937 obligations include allotments of $660 from "Soil and moisture conservation operations, demonstrations, and information" and $3,240 from "General administrative expenses", Soil Conservation Service.

WORK UNDER THIS APPROPRIATION

General.--Under this appropriation the Office of Information makes available to the public information on useful results arising from the economic, research, service, conservation, regulatory, and special programs of the Department. Scientists of the Department develop information of direct importance to farmers and others. Problems are solved by workers located in different bureaus. Before information can be useful to the public it must be brought together from different specialists and interpreted along commodity lines. The information must be available, prepared, and presented in an accurate, understandable form. The Office of Information is responsible for this work. It relies mainly on publications, the press, and radio. The Office is concerned with all the problems involved in the informational activities of the Department, including the editorial, illustrating, printing, and distribution phases. It also supervises the informational activities of the bureaus and offices and cooperates with 240 radio stations daily, which donate to the Department 35,000 hours of time annually. The Office also prepares or supervises the preparation of approximately 1,700 press releases and 3,000 radio manuscripts annually, and edits about 1,400 technical and popular manuscripts. To maintain an effective policy for agricultural information, the Office of Information cooperates with the State experiment stations and extension services and correlates Department information with that of other Federal agencies. At present greatest emphasis is being placed on conservation or land-use programs. The development of an Office of Land Use Coordination within the Department is making it possible for the Office of Information, among other things, to give the public correlated information on related conservation activities such as forestry, wildlife, and erosion

and flood control, all of which have an influence on the proper and wise use of both public and private lands.

1. General Administration of Office of Information and of Informational Work of Department.--This Office is handling an increasing amount of administrative activities, including the correlation of the information activities of the Department with those of other Federal agencies, the land-grant colleges, and extension services. It establishes and controls information policies and procedures and gives general supervision to related activities in the bureaus and offices of the Department. In a broad sense, the Office serves as a bridge between the farmer and the scientist, over which is conveyed to the farmer the knowledge of the Department in practical form and, in the opposite direction, the needs of farmers are conveyed to the scientists of the Department, who focus their efforts on the most critical agricultural problems concerning which farmers desire useful information.

2. Business Service, including Mails and Files.--The financial, business, purchasing, personnel, and legal affairs of the Office of Information are handled by this division. It includes the central file section, which handles a large volume of letters, vises outgoing mail, and maintains subject-matter files and a library for the Office of Information.

3. Publications Preparation and Control.--From the total quantity of informational material prepared by the Department each year the Office of Information must choose what is to be published, determine the form of publication, and the quantity. Under available funds it is impossible to publish all significant material developed in the Department. If this could be done there would be issued approximately 3,000 new circulars and bulletins of various types each year. Because of the limitation of funds for the publication of Department material, the Office of Information selects and arranges for the publication of approximately 1,400 manuscripts, including very technical material covering basic economic and scientific research, as well as popular manuscripts carrying practical advice to farmers and others. The Office handles the editing, indexing, illustrating, and printing work involved. It also prepares the Yearbook of Agriculture and the annual report of the Department.

4. Distribution of Agricultural Information Directly to the Public.--Each working day the Office of Information receives several thousand requests for information. It handles many of these by sending appropriate bulletins. First, the distribution staff must determine the proper bulletins to send in response to each request, and, secondly, the distribution must be made promptly. The use of Department publications has been found the cheapest and most effective way to get agricultural science into practice and to place economic information into the hands of interested persons. The work of this division requires skill and experience, for the requests for information must be met from a supply of bulletins on many different subjects. In addition, the division distributes publications regularly to a very small group of cooperating scientists, libraries, and county agents, who receive selected bulletins direct through the use of classified mailing lists. Specific requests received by Members of Congress are also handled

by the division. The cost to the Government for printing and mailing popular bulletins is slightly more than 1 1/2 cents each. If a special letter had to be prepared in response to requests, the cost would average about 30 cents each.

5. Preparation and Distribution of Agricultural Information to the Press.--Information arising from the various activities of the Department is distributed by the Office of Information in appropriate form directly to the press, including newspapers, farm papers, trade journals, technical publications, press associations, special writers, and correspondents.

Since the Soil Conservation Service and the Farm Security Administration have become parts of the Department the work of the Office of Information has increased correspondingly. Making useful information available to farmers, homemakers, and others through newspapers and magazines is one important method of reaching large numbers of interested persons quickly and at small cost. Such information gives readers the latest practical facts on the results of the scientific, economic, and regulatory work and on the land-use and conservation programs of the Department. This does not include material for the Agricultural Adjustment Administration. The output of press releases amounts to about 1,700 each year. However, no single publication receives all releases, because each is mailed only to publications interested in the particular subject matter of the specific release.

6. Preparation and Distribution of Agricultural Information by Radio.--The Office of Information uses the radio networks and stations to make available to farmers, homemakers, and others timely information of immediate value. Much of the information developed by the Department must be distributed widely and rapidly. Radio facilities, donated by the broadcasting companies, are particularly helpful in transmitting economic and related information. The Office prepares and produces daily, except Saturday and Sunday, 15- to 20-minute information programs, broadcast as one feature of the National Farm and Home Hour, presented by the National Broadcasting Company and transmitted by 71 associated stations in the Eastern, Central, and Mountain time zones. In addition, 15 to 20 minutes daily of information for farmers and homemakers is prepared and produced by a field office in San Francisco and presented by the National Broadcasting Company in the Western Farm and Home Hour, transmitted by 15 stations.

The Office of Information also cooperates in presenting once each week a 15-minute broadcast on a National Broadcasting Company network of 30 stations, giving useful information to consumers. The Department part of this program is prepared in collaboration with the Consumers' Counsel of the Agricultural Adjustment Administration. The Office prepares and sends to 240 independent stations daily, except Sunday, a 7-minute program of practical suggestions for farmers. The Office likewise sends to 220 stations a daily 7-minute program of information for consumers and homemakers. A total of about 35,000 broadcast hours is utilized each year for presenting timely information by radio. This time is provided by the

broadcasting companies and is not paid for by the Department. The Office strives to obtain schedules of maximum usefulness to farmers and homemakers for the transmission of official information and to correlate the broadcasting of the Department and the various State agricultural extension services.

7. Addressing, Duplicating, and Mailing Service for the Department.--For purposes of economy and efficiency, the Office of Information maintains a plant to handle the addressing, duplicating, and mailing work for most of the bureaus and offices of the Department. Duplication is essential for rapid distribution of administrative material, radio and press releases, market reports, progress reports, and other information too ephemeral in nature to justify printing.

ALLOTMENTS OF A.A.A. AND EMERGENCY FUNDS

Projects	Obligated, 1937	Estimated obligations, 1938	Estimated obligations, 1939
Conservation and Use of Agricultural Land Resources, Department of Agriculture: For informational work in connection with agricultural conservation programs...	$13,516	$12,120	$12,120
*National Industry Recovery, Interior, Soil Erosion Prevention (Transferred to Agriculture):....	375	- - -	- - -
*Public Works Administration, Allotment to Interior, Soil Erosion Prevention (Transferred to Agriculture)	375	- - -	- - -
*Emergency Relief, Agriculture, Administrative Expenses (Soil Conservation Service).....	2,500	- - -	- - -
Total.....	16,766	12,120	12,120

*For informational work in connection with soil-erosion prevention programs.

(b) PRINTING AND BINDING

Appropriation Act, 1938.....	$887,650
Allotments from "Salaries and Expenses, Soil Conservation Service", which have been reduced correspondingly in the estimates for 1939 (for printing and binding work done for that bureau):	
"General Administrative Expenses"...	+5,110(1)
"Soil and Moisture Conservation and Land-Use Investigations".....	+6,509(1)
"Soil and Moisture Conservation Operations, Demonstrations, and Information".....	+195,701(1)
Total available, 1938.....	1,094,970
Budget Estimate, 1939.....	1,094,970

(1) The 1939 estimate for printing and binding - $1,094,970 - is the same as the amount available for this purpose in 1938. However, the printing and binding fund in 1939 will, for the first time, include the requirements of the Soil Conservation Service. In 1938 the regular appropriation is $887,650, and the estimated expenditures for printing and binding by the Soil Conservation Service are $207,320. These two amounts comprise the total estimate for 1939, and the estimates of the Soil Conservation Service include a reduction ($207,320) of the amount thus transferred.

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
1. Job work and binding, expenditures for printing:			
(a) Binding.....	$34,622	$30,400	$30,400
(b) Emergency field printing.....	2,785	8,700	8,700
(c) Job work.....	268,738	314,300	314,300
(d) Letterheads.....	27,936	25,600	25,600
Total.....	334,081	379,000	379,000

PROJECT STATEMENT - Continued

Projects	1937	1938 (Estimated)	1939 (Estimated)
2. Reports, periodicals, and other regulatory, service, and administrative publications, expenditures for printing:			
(a) Agricultural Situation.....	$7,916	$18,000	$18,000
(b) Annual reports.....	13,352	11,900	11,900
(c) Climatological Data.....	12,570	16,300	16,300
(d) Congressional documents.....	2,997	2,900	2,900
(e) Crops and Markets.....	21,693	18,000	18,000
(f) Experiment Station Record....	17,656	17,500	17,500
(g) Extension Service Review.....	6,000	6,000	6,000
(h) Farmers' Bulletin lists.....	4,540	3,050	3,050
(i) Forest folders.....	8,671	6,000	6,000
(j) Indexes.....	16,399	4,800	4,800
(k) Inventory of Seeds and Plants Imported.....	342	2,100	2,100
(l) Journal of Agricultural Research.....	4,866	5,850	5,850
(m) Monthly List of Publications.	971	900	900
(n) Monthly Weather Review.....	10,567	10,500	10,500
(o) Monthly Weather Review Separates.....	2,891	1,300	1,300
(p) Service and Regulatory Announcements.....	27,000	25,400	25,400
(q) Soil Conservation Magazine...	6,000	8,500	8,500
(r) Unnumbered publications.....	19,214	26,400	26,400
(s) Yearbook of Agriculture.....	20,000	19,000	19,000
(s-1) Agricultural Statistics....	10,177	10,000	10,000
Total.....	213,822	214,400	214,400
3. Research and technical bulletins, expenditures for printing:			
(a) Circulars.....	17,426	19,980	19,980
(b) Erosion reports.....	3,742	60,000	60,000
(c) Experiment station bulletins and reports.....	1,211	2,300	2,300
(d) Journal of Agricultural Research separates.....	16,479	19,000	19,000
(e) Reprints of former series and of outside articles.....	5,017	2,440	2,440
(f) Soil surveys.....	83,290	90,000	90,000
(g) Statistical bulletins.....	13,780	10,500	10,500
(h) Technical bulletins.....	45,601	66,550	66,550
Total.....	186,546	270,770	270,770

PROJECT STATEMENT - Continued

Projects	1937	1938 (Estimated)	1939 (Estimated)
4. Farmers' Bulletins and other popular publications, expenditures for printing:			
(a) Clip Sheet.....	$2,703	$3,100	$3,100
(b) Farmers' Bulletins - new	24,713	35,300	35,300
(c) Farmers' Bulletins - reprints and revisions.....	132,942	144,200	144,200
(d) Leaflets - new.....	2,681	2,600	2,600
(e) Leaflets - reprints and revisions.....	7,605	7,600	7,600
(f) Miscellaneous publications..	54,422	33,500	33,500
(g) Posters.....	2,674	3,400	3,400
(h) Yearbook separates.....	3,742	1,100	1,100
Total.....	231,482	230,800	230,800
Total appropriation.....	965,931(a)	1,094,970	1,094,970

(a) 1937 obligations include allotments of $111,681 of Soil Conservation Service funds as follows: $23,652 from "General Administrative Expenses", $1,767 from "Soil and Moisture Conservation and Land-Use Investigations", and $86,262 from "Soil and Moisture Conservation Operations, Demonstrations, and Information."

The work under this appropriation consists of publishing the results of the scientific and economic research work of the Department; printing material essential to the regulatory, service, and conservation programs; printing forms, letterheads, certificates, and other material classified as job work. Printing funds available to the older branches of the Department decreased from $1,000,000 in 1932 to $660,000 in 1933; they have since been increased to the $887,650 indicated above. These increases have been to offset the increased cost of printing, to provide additional funds for popular and technical bulletins, and, in general, to work toward the point at which the central fund will be more adequate to meet the ordinary needs of the Department. The cost of paper is now about 16 percent higher than at the beginning of the 1938 fiscal year. Actually, therefore, the Department will obtain less printing and binding under the estimate for 1939 than it has for the same amount during 1938.

The printing and binding work of the Department is classified under four headings:

(1) Job work and binding.

(2) Administrative publications.

(3) Research and technical publications.

(4) Popular publications.

Material in the first two groups is essential to efficient administration within the Department itself. Publications falling within the third group are vital to research scientists, teachers, and others. Included in this third group are the soil surveys which furnish basic information on soil types, series, and phases essential to other branches of agricultural research and in all agricultural planning work; and soil-erosion reports, including maps of representative watershed areas and recommended land-use practices which, if adopted, will control erosion. The popular publications (group 4) are used to disseminate practical knowledge to farmers, transporters, business men, housewives, processors, and the general public.

1. Job Work and Binding

(a) Binding. - Most of the binding work in the Department is done for the central Department Library, the Weather Bureau library, and the Office of Experiment Stations library. The average cost of binding was formerly about $1.50 to $1.90 a volume. It is now nearly $2.25 a volume. It is important to keep this material reasonably current if the Library is to give service because current material is in greatest demand.

(b) Emergency Field Printing. - Inspection tags, certificates, forms for agricultural representatives abroad, fire-protection signs, etc., are often needed quickly and consequently cannot be printed in Washington, D.C. This item covers these emergency needs.

(c and d) Job Work and Letterheads. - Crop-reporting forms, schedules, administrative forms, certificates, etc., are indispensable simply to carry on the regular activities of the Department. Job printing needs have increased materially. In 1938 several bureaus had to curtail expenditures below actual needs for efficient administration and to use all stock on hand. Furthermore, paper and composition costs have increased and many forms formerly duplicated must now be printed as a result of a decision by the Acting Comptroller General.

2. Reports, Periodicals, and other Regulatory, Service, and Administrative Publications

(a) Agricultural Situation. - This periodical is used to keep key groups currently informed of the economic situation, including statistics relating to production, movement, consumption, prices, and purchasing power of various commodities. It is sent monthly to crop reporters, a small group of cooperating economists, technical workers, extension agents, and officials of the Agricultural Adjustment Administration.

(b) Annual reports. - Many of the reports under this item are required by law. They make a permanent record of the work performed during the preceding fiscal year. These reports are considerably below their former size.

(c) Climatological Data. - In addition to the regular issuance of Climatological Data, Bulletin W (Summaries of Climatological Data) is being published. It comprises 106 separates covering the United States, Alaska, and Hawaii.

(d) Congressional documents. - Under this item the Department pays for copies of bills, resolutions, reports, Congressional directories, Congressional Records, etc., as Congressional documents.

(e) Crops and Markets. - This periodical contains statistics and information on crop and livestock estimates (the printing of many of which is mandatory), market information, reports on supplies, stocks, commercial movements, etc.

(f) Experiment Station Record. - This periodical is the cheapest and most effective means of keeping before all research workers abstracts of the world's economic and scientific literature on agriculture. In this way the Experiment Station Record assists research workers in keeping informed on current scientific developments, with particular reference to the research reports from the State experiment stations, and it effectively promotes the coordination of research itself.

(g) Extension Service Review. - Current information on extension practices is published in this periodical for distribution monthly throughout the extension organization. The periodical also serves to keep extension agents informed on actions of the Agricultural Adjustment Administration. It reviews new extension developments in the various State institutions. It is especially important at this time because extension officials cooperate in the Soil Conservation and Domestic Allotment and other land-use programs.

(h) Farmers' Bulletin lists. - These lists are furnished to Members of Congress, extension agents, and farmers to show available publications. Farmers' Bulletins are mailed only upon request.

(i) Forest folders. - Folders are used to induce the millions of visitors to use the national forests properly in order to reduce the fire hazard. They are also being used by members of the Civilian Conservation Corps as a source of information on forestry purposes and practices.

(j) Indexes. - Indexes become increasingly important as Department publications increase in number and scope.

(k) Inventory of seeds and plants imported. - Importations of seeds and plants are becoming more important because of the Department's search for erosion and drought resistant vegetation. These inventories contain a record of new and little-known seeds and plants procured mostly from abroad for the use of the Department, State experiment stations, and experimenters in appropriate locations throughout the United States.

(l) Journal of Agricultural Research. - The Journal of Agricultural Research carries the most technical reports of pure research performed in the Department and the State experiment stations. Its distribution is limited rigidly to selected libraries.

(m) Monthly List of Publications. - For economy the Department does not list those who ask to receive all printed publications. The list of new publications is mailed instead. Scientists, economists, foreign and domestic libraries, and teachers make up the bulk of the mailing list.

(n) and (o) Monthly Weather Review and separates. - Reports of research by the staff of the Weather Bureau are published with records of weather observations in the United States, with climatological charts. The periodical also deals with floods, storms, earthquakes, solar radiation, etc. It is distributed to Weather Bureau field stations, Signal Corps, meteorological, and naval air stations, and libraries. For purposes of economy, the separates, each covering a single subject or group of statistics, are distributed separately. This, the only meteorological publication of its kind in the country, is the textbook for weather officials. It is exchanged with foreign weather services. The general public can obtain copies only by purchase.

(p) Service and Regulatory Announcements. - Bureau of Animal Industry orders, notices of judgment under the Food and Drugs Act, notices of quarantine, etc., are mandatory and essential in carrying forward the regulatory programs.

(q) Soil Conservation magazine. - This periodical, issued monthly and sent to a selected list of staff members of the Department and associated agencies, (1) conveys administrative information to members of the field staff of the Soil Conservation Service; (2) equips specialists of the Service and cooperating agencies with current technical and scientific knowledge in soil conservation and related fields; (3) serves as a clearing house of ideas and experiences; (4) provides a valuable archive of conservation history; and (5) serves as a reference work of authentic and practical information concerning a comprehensive action program which involves the application of many new technical developments and improvements.

(r) Unnumbered publications. - This series is used for various bulletins which cannot logically be classified in the other Department series. Examples include such publications as "Science Serving Agriculture," "Topsoil, Its Preservation," and "Soil and Water in the Northern Great Plains."

(s) Yearbook of Agriculture. - The Yearbook, which is an annual publication required by law, presents information on the new developments of agriculture. The 1936 and 1937 Yearbooks consisted of a comprehensive treatment of the subject of plant and animal breeding. The 1938 Yearbook will deal comprehensively with the subject of soils and soil conservation. The bulk of the Department's distribution is to its own collaborators, and the Congressional distribution (paid for from Congressional funds) is to farmers.

(s-1) Agricultural Statistics. - The statistics previously incorporated in the Yearbook of Agriculture are now published in a separate volume for purposes of economy. Doubtless not more than 10 percent of those who receive the Yearbook are interested in the detailed statistics. Moreover, many persons have a distinct need for additional statistics which were not previously published in the Yearbook.

(3) Research and Technical Bulletins

(a) Circulars. - Circulars report in semitechnical form current results of the manifold research programs of the Department. Some examples are "The House Rat," "Peach Mosaic Identification and Control," "Emergency Wind Erosion Control," and "American Grape Varieties."

(b) Erosion reports. - Soil-erosion reconnaissance reports are used by soil conservation districts, county planning agencies, extension services, and other organizations in developing general conservation plans. Detailed soil-erosion reports are used primarily by individual farmers in making new farm management plans for the control of erosion on their own farms. The publication of these reports heretofore has been financed by the Soil Conservation Service. In 1939 $60,000 will be needed for their publication. This is the same amount as the Service expects to spend for printing the reports during 1938. They are of 2 general types: (1) Erosion reconnaissance reports, accompanied by lithographed maps with a scale usually of 1 or 1/2 inch to the mile, to give a general picture of erosion conditions on comparatively large areas. These publications, including both text and maps, are used for general land-use planning in which erosion conditions must be considered. Reports of this type contemplated for publication in 1939 will cover a total of more than 40,000 square miles. In addition, it is proposed to lithograph general reconnaissance erosion maps of the entire States of Washington and Oregon, covering approximately 190,000 square miles, on a scale of 1 inch to approximately 200 miles. The printing cost of reconnaissance maps and reports will amount to at least $28,000. (2) Reports giving detailed information applicable to individual farms, including degree of erosion, slope, type of vegetative cover, and other factors which the farmer and conservation worker must consider in the control of erosion. The reports will be used for the purpose of explaining the use of diagrammatic maps, usually at a scale of 4 inches to the mile, reproduced by an inexpensive duplicating process. They will contain information designed for use by the individual farmer; soil conservation districts, now authorized by law in 22 States; extension service workers; county agents; and many others interested in laying out detailed farm-management plans to control erosion on each field. The reports will cost about $32,000 for printing in 1939. The printed text will give correlated summaries of physical factors of the land and recommendations as to what may be done by the farmer to conserve the soil under each of the conditions depicted by the duplicated maps. Duplication will be used for reproducing the maps because (a) it is by far the most economical method, and (b) some of the factors shown, such as vegetative cover, are apt to change rapidly as farmers plan their farms in accordance with the recommendations. The cost for duplicating the maps is less than 40 percent of the cost of lithographing.

(c) Experiment Station bulletins and reports. - This series is used to report the results of work done at the insular research stations and includes also the annual reports of the insular stations.

(d) Journal of Agricultural Research separates. - As the bound copies of the Journal itself are sent to a very restricted mailing list, separates are printed for scientists who request technical information on the specific subject covered. Only libraries and foreign institutions on an exchange list receive the Journal itself free of charge.

(e) Reprints of former series and of outside articles. - A number of series, such as Department Bulletins, Department Circulars, and Miscellaneous Circulars, have been superseded by other series. However, much scientific information contained in the older publications is necessary in carrying on current work and can be reprinted for less than it would cost to print new manuscripts. The Department also sometimes buys 100 to 200 copies of reprints of current technical material prepared by Department scientists but printed in nongovernmental publications.

(f) Soil surveys. - The soil survey publications are mandatory by law. In 1930 the Department paid approximately $75,000 for printing soil surveys. In 1931 the expenditure was $97,000. In 1932 and 1933 the normal expenditures would have been approximately $100,000 each year, but to effect economies the Department spent only slightly more than $40,000 each year. Since then the fund available for publishing soil surveys has been increased to $90,000. In April 1937, when the last report on surveys was submitted to the Appropriations Subcommittee, there were 154 surveys completed in the field which had not been published. In December 1937 this figure was 157.

Soil surveys serve many purposes in research and extension programs. They are a permanent record of soil factors, knowledge of which is essential as a guide to farmers and Federal, State, and private agencies interested in the adaptabilities and values of various lands. For reasons of economy the soil surveys are published on the smallest scale consistent with convenience in filing, ease of handling, and showing needed information over as large an area as possible on a single sheet. Usually this can be done at a scale of 1 inch to the mile, which keeps the cost as low as possible and shows a large area on a single sheet. This is necessary for such purposes as rural zoning, county planning, and other activities which involve a large number of farms or large area of land. On such a map it is convenient to compare various portions of a large area on one complete base map. Where soils, topography, and other factors are rather uniform over extensive areas a smaller scale may be used. The survey maps and textual information accompanying them are becoming increasingly useful in connection with the coordination of broad land-use programs of the Department and cooperating agencies, and are extensively used for program planning by the Extension Service, State Planning Boards, State colleges and experiment stations, Federal and private credit agencies, and by fertilizer companies and many other agencies whose work is affected by the general distribution of various land types.

(g) Statistical bulletins. - All statistical publications, including those on futures trading - the printing of many of which is mandatory - are contained in this series. Some examples are "Wheat Futures," "Corn Futures," "Grade, Staple Length, and Tenderability of Cotton in the United States," and "Stumpage and Log Prices."

(h) Technical bulletins. - This is one of the most important series of publications issued by the Department. Technical bulletins form a permanent record of research results for Department scientists, cooperating institutions, and scientists of the experiment stations. The Department faces the condition of achieving valuable research results without having the opportunity of giving these results to the public in a usable form. Even though every effort has been made to reduce the length of each manuscript and the number of copies printed of each technical bulletin in order to conserve printing funds, many important research manuscripts have not been published. If a research report is to be valuable, it must be complete; too great a reduction destroys its usefulness. Consequently, under present conditions, it is often necessary to complete the preparation and editing of technical manuscripts and then to hold them until funds for their printing are available.

(4) Farmers' Bulletins and Other Popular Publications

(a) Clip Sheet. - The Clip Sheet, sent weekly to 3,500 newspapers, contains brief material on improved farm practices, economic adjustments, conservation farming practices, and accounts of Department activities.

(b, c, d, and e) Farmers' Bulletins and Leaflets - new and reprints. - Farmers' Bulletins are published to place useful information in the hands of farmers. They constitute one of the most effective means of putting science into practice. Four-fifths of all Farmers' Bulletins are distributed by Members of Congress. The Department and most Members of Congress mail Farmers' Bulletins only upon specific request. The Leaflets are merely 4- and 8-page Farmers' Bulletins. These bulletins cost only about 1 1/2 cents a copy. If they did no more than enable the Department to answer correspondence expeditiously and efficiently, they would be worth far more than they cost, as the cost of preparing and mailing a special letter in response to requests for information averages about 30 cents. As the printing requirements of the Soil Conservation Service during the fiscal year 1939 will be met from the central printing and binding fund, there will be a considerable increase in the number and distribution of Farmers' Bulletins and other popular publications handled under the central fund. As a result of a new concern on the part of farmers regarding soil and fertility losses, there is a heavy demand for practical conservation information.

(f) Miscellaneous publications. - Nontechnical material for specialized distribution is contained in the miscellaneous publications. Among them are some conservation publications carrying practical information to the public and such publications as the "Agricultural Outlook," "List of Available Publications," "List of Technical Workers," etc. The material is largely nontechnical and the distribution is always specialized.

(g) Posters. - Posters are used only sparingly by the Department and then only in connection with special campaigns such as those involving the elimination of livestock diseases, forest fire protection, and various conservation programs.

(h) Yearbook separates. - The Yearbook contains a number of separate, specialized articles comprising related parts in the complete treatment of a broad subject such as genetics or soils. Separates are printed in very small volume for use in answering correspondence.

EMERGENCY FUNDS

Projects	Obligated, 1937	Estimated obligations, 1938
Emergency Relief Appropriation Act of 1935: For standard and departmental forms for use in connection with emergency relief programs of the department.....	$15,000	$3,000
Emergency Relief, Agriculture, Administrative Expenses, Soil Conservation Service: For printed forms and letterheads.....	5,306	- - -
Total.....	20,306	3,000

A.A.A. AND EMERGENCY FUNDS

(Complete bureau statement)

Projects	Obligated, 1937	Estimated obligations, 1938	Estimated obligations, 1939
Conservation and Use of Agricultural Land Resources, Department of Agriculture: For informational work in connection with agricultural conservation programs.....	$13,516	$12,120	$12,120
Emergency Relief, Agriculture, Administrative Expenses, Soil Conservation Service: For printed forms and letterheads used in connection with soil-erosion prevention programs.....	5,306	- - -	- - -
Emergency Relief Appropriation Act of 1935: For standard and departmental forms for use in connection with emergency relief programs of the department.....	15,000	3,000	- - -
Emergency Relief, Agriculture, Administrative Expenses, Soil Conservation Service: For informational work in connection with soil-erosion prevention programs..	2,500	- - -	- - -
National Industry Recovery, Interior, Soil Erosion Prevention (Transferred to Agriculture): For informational work in connection with soil-erosion prevention programs.....	375	- - -	- - -
Public Works Administration, Allotment to Interior, Soil Erosion Prevention, (Transferred to Agriculture): For informational work in connection with soil-erosion prevention programs.....	375	- - -	- - -
Total.....	37,072	15,120	12,120

LIBRARY

SALARIES AND EXPENSES

Appropriation Act, 1938..... $105,420
Budget Estimate, 1939..... 105,420

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
1. General administration and business service.....	$16,994	$18,510	$18,510
2. Acquisition of publications by purchase, gift, and exchange, and preparation of material for binding.....	47,988	48,800	48,800
3. Classifying, cataloguing, and indexing of publications.....	21,441	20,495	20,495
4. Circulation, reference, and bibliographical service.....	16,877	17,615	17,615
Unobligated balance.....	500	- - -	- - -
Total appropriation.....	103,800	105,420	105,420

WORK UNDER THIS APPROPRIATION

The Department Library is one of the basic units in the research, extension, and regulatory work of the Department and the State agricultural agencies. It performs a most important and essential service which is in constant use in all branches of the Department's work. With its specialized branch libraries in the various bureaus it contains in all approximately 275,000 volumes on agriculture and the related sciences, technology, and economics, including the official agricultural publications from foreign countries as well as the United States. It is the largest special collection of this kind in the country. Its catalogues and special indexes on subjects connected with the Department's work number more than a million cards. They constitute an invaluable record of the findings of scientific investigations in the field of agriculture all over the world and enable the Library to act as a clearing house of bibliographical information relating to the literature of agriculture in all its phases.

The appropriation of the Library is used for four main purposes, as follows: (1) for the acquisition of books, periodicals, newspapers, and other publications needed in the work of the Department; (2) for the work of entering these publications in the permanent catalogues and other records of the Library; (3) for the reference and bibliographical service necessary to make these publications readily available to users of the Library and to answer the various bibliographical inquiries addressed to the Department; and (4) for the circulation of the Library's books and periodicals to Department workers and to other research institutions, particularly to the State agricultural colleges and experiment stations.

SUPPLEMENTAL FUNDS

Direct Allotments

Projects	Obligated, 1937	Estimated Obligations, 1938	Estimated Obligations, 1939
Agricultural Adjustment Administration (Salaries and Expenses):			
Transferred to Library for reference work and circulation of books and periodicals.....	$3,240	$3,240	$3,240

OFFICE OF EXPERIMENT STATIONS

(a) PAYMENTS TO STATES, HAWAII, ALASKA, AND PUERTO RICO FOR AGRICULTURAL EXPERIMENT STATIONS

Appropriation Act, 1938.....	$6,232,500
Budget Estimate, 1939.....	6,250,000
Increase.....	17,500

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Increase
1. Hatch Act (Act March 2, 1887)..	$720,000	$720,000	$720,000	- - -
2. Adams Act (Act March 16, 1906).	720,000	720,000	720,000	- - -
3. Purnell Act (Act February 24, 1925).....	2,880,000	2,880,000	2,880,000	- - -
4. Hawaii Station Act (Act May 16, 1928).....	50,000	50,000	60,000	+$10,000(1)
5. Alaska Station Act (Act February 23, 1929).....	15,000	15,000	15,000	- - -
6. Alaska Station Act (Act June 20, 1936).....	- - -	7,500	10,000	+ 2,500(2)
7. Puerto Rico Station Act (Act March 4, 1931).....	35,000	40,000	45,000	+ 5,000(3)
8. Bankhead-Jones Act, Title I (Act June 29, 1935).....	1,200,000	1,800,000	1,800,000	- - -
Total appropriation.....	5,620,000	6,232,500	6,250,000	+ 17,500

INCREASES

The increase of $17,500 in this item for 1939 consists of:

(1) An increase of $10,000 in the project covering payments to the Hawaii Agricultural Experiment Station under the Hawaii Station Act of May 16, 1928, authorized by the Hawaii Station Act. The $10,000 increase for 1938, which was authorized by the Act, approved by the Bureau of the Budget and passed by the House, was omitted from the appropriation in final action by Congress.

The appropriations under this item accrue to the benefit of the Territorial agricultural experiment station, which by law is conducted jointly and in collaboration with the Federal experiment station. The appropriation for the Federal station was reduced $10,000 for the fiscal year 1938 to offset the proposed increase in the appropriation under this item to the Territorial station. Although the increase in the appropriation to the Territorial station was not granted for 1938, the policy was continued for the fiscal year 1939 of decreasing

appropriations to the Federal station as increases are made in the appropriations to the Territorial station. In view of the authorized increase of $10,000 to the Territorial station under this item for 1939, no appropriation has been included for an independent Federal station under the item Insular Experiment Stations.

(2) An increase of $2,500 in the project covering payments to the Alaska Agricultural Experiment Station under the Alaska Station Act of June 20, 1936. This increase is for the purpose of carrying out the provisions of the Act of June 20, 1936, which authorizes an appropriation of $10,000 for the Alaska Station for the fiscal year 1939, as compared with $7,500 for the fiscal year 1938.

(3) An increase of $5,000 in the project covering payments to the Puerto Rico Agricultural Experiment Station under the Puerto Rico Station Act of March 4, 1931. This increase is for the purpose of carrying out the provisions of the Act of March 4, 1931, which authorizes an appropriation of $45,000 for the Puerto Rico Station for the fiscal year 1939, as compared with $40,000 for the fiscal year 1938.

WORK UNDER THIS APPROPRIATION

General.--The several appropriations under "Payments to States," etc., are made to aid and encourage research on the agricultural industry at the State, Territorial, and Puerto Rican agricultural experiment stations. The funds are warranted direct by the Treasury Department, upon certification by the Secretary of Agriculture, to the institutions designated by the several States, Hawaii, Alaska, and Puerto Rico under the following Acts:

1. The Hatch Act (March 2, 1887) authorizes $15,000 per annum to each State for agricultural experiment stations to "aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and applications of agricultural science."

2. The Adams Act (March 16, 1906) authorizes $15,000 per annum to each State for the more complete endowment and maintenance of the State agricultural experiment stations to be "applied only to paying the necessary expenses of conducting original researches or experiments bearing directly on the agricultural industry of the United States."

3. The Purnell Act (February 24, 1925) authorizes $60,000 per annum to each State for the more complete endowment of agricultural experiment stations to be "applied only to paying the necessary expenses of conducting investigations or making experiments bearing directly on the production, manufacture, preparation, use, distribution, and marketing of agricultural products and including such scientific researches as have for their purpose the establishment and maintenance of a permanent and efficient agricultural industry and such economic and sociological investigations as have for their purpose the development and improvement of the rural home and rural life and for printing and disseminating the results of said researches."

4. The Hawaii Station Act (May 16, 1928) extends the benefits of the Hatch, Adams, and Purnell Acts to the Territory of Hawaii and authorizes appropriations for this purpose as follows: Fiscal year 1930, $15,000; 1931, $20,000; 1932 to 1936, inclusive, $2,000 increase each year over the preceding year; 1937, $50,000;

1938 to 1941, inclusive, $10,000 increase each year over the preceding year; and thereafter $90,000 per year.

5. The Alaska Station Act (February 23, 1929) extends the benefits of the Hatch Act to the Territory of Alaska and authorizes an appropriation of $15,000 per annum for this purpose.

6. The Alaska Station Act (June 20, 1936) extends the benefits of the Adams and Purnell Acts to the Territory of Alaska and authorizes appropriations as follows: Fiscal year 1937, $5,000; 1938, $7,500; 1939 to 1944, inclusive, $2,500 increase each year over the preceding year; 1945 to 1947, inclusive, $5,000 increase each year over the preceding year; and thereafter a sum equal to one-half that provided for each State and Territory under the Adams Act and the Purnell Act.

7. The Puerto Rico Station Act (March 4, 1931) extends the benefits of the Hatch, Adams, and Purnell Acts to Puerto Rico and authorizes appropriations as follows: Fiscal year 1933, $15,000; 1934 to 1940, inclusive, $5,000 increase each year over the preceding year; 1941 to 1944, inclusive, $10,000 increase each year over the preceding year; and thereafter $90,000 per year.

8. The Bankhead-Jones Act, Title I (June 29, 1935).--The principal points of this Title of the Act are as follows:

Section 1 authorizes and directs the Secretary of Agriculture "to conduct research into laws and principles underlying basic problems of agriculture in its broadest aspects; research relating to the improvement of the quality of, and the development of new and improved methods of production of, distribution of, and new and extended uses and markets for, agricultural commodities and byproducts and manufactures thereof; and research relating to the conservation, development, and use of land and water resources for agricultural purposes." The research authorized under this section is conducted by such agencies of the Department of Agriculture as the Secretary may designate or establish.

Under Section 2 the Secretary is authorized and directed to encourage research similar to that authorized under section 1 to be conducted by the agricultural experiment stations of the land-grant colleges.

To accomplish these two purposes, Section 3 authorizes an appropriation of "$1,000,000 for the fiscal year beginning after the date of the enactment of this title, and for each of the four fiscal years thereafter $1,000,000 more than the amount authorized for the preceding fiscal year, and $5,000,000 for each fiscal year thereafter."

Section 4 provides that "Forty per centum of the sums appropriated for any fiscal year under section 3 shall be available for the purposes of section 1" and that not more than "2 per centum of the sums appropriated may be used for the administration of section 5." The sums available for the purposes of section 1 are designated as the "Special research fund, Department of Agriculture", one-half of which is for "the establishment and maintenance of research laboratories and facilities in the major agricultural regions" and for the prosecution of research at such laboratories.

Section 5 provides that sixty per centum of the sums appropriated in any fiscal year shall be available for the purposes of section 2 and that the

Secretary shall make the allotments to Puerto Rico and each State and Territory on the basis of rural population. This section provides further "No allotment and no payment under any allotment shall be made for any fiscal year in excess of the amount which Puerto Rico or the State or Territory makes available for such fiscal year out of its own funds for research and for the establishment and maintenance of necessary facilities for the prosecution of such research."

The allotments under the Act to the several States, Alaska, Hawaii, and Puerto Rico for the fiscal years 1937 and 1938 and the allotments as estimated for 1939 are shown in the following table:

Payments to States, Hawaii, Alaska, and Puerto Rico under Bankhead-Jones Act, Title I.

State	1937	1938 (same amounts estimated for 1939)
Alabama.....	$41,347.56	$62,021.34
Alaska.....	1,118.24	1,677.36
Arizona.....	6,211.28	9,316.92
Arkansas.....	31,991.60	47,987.40
California.....	32,970.98	49,456.47
Colorado.....	11,215.48	16,823.22
Conn. (New Haven).....	5,164.52	7,746.78
Conn. (Storrs).....	5,164.52	7,746.78
Delaware.....	2,505.10	3,757.65
Florida.....	15,400.82	23,101.23
Georgia.....	43,761.46	65,642.19
Hawaii.....	4,593.20	6,889.80
Idaho.....	6,859.28	10,288.92
Illinois.....	43,368.26	65,052.39
Indiana.....	31,361.30	47,041.95
Iowa.....	32,427.32	48,640.98
Kansas.....	25,025.48	37,538.22
Kentucky.....	39,469.02	59,203.53
Louisiana.....	27,566.72	41,350.08
Maine.....	10,346.08	15,519.12
Maryland.....	14,275.24	21,412.86
Massachusetts.....	9,091.10	13,636.65
Michigan.....	33,483.92	50,225.88
Minnesota.....	28,398.82	42,598.23
Mississippi.....	36,325.70	54,488.55
Missouri.....	38,483.90	57,725.85
Montana.....	7,751.58	11,627.37
Nebraska.....	19,388.30	29,082.45
Nevada.....	1,230.32	1,845.48
New Hampshire.....	4,178.60	6,267.90
New Jersey.....	15,262.92	22,894.38
New Mexico.....	6,880.50	10,320.75
New York (Geneva).....	4,491.58	6,737.37
New York (Ithaca).....	40,424.24	60,636.36
North Carolina.....	51,314.00	76,971.00
North Dakota.....	12,337.88	18,506.82
Ohio.....	46,507.38	69,761.07
Oklahoma.....	34,225.42	51,338.13
Oregon.....	10,087.90	15,131.85
Pennsylvania.....	67,344.76	101,017.14
Puerto Rico.....	24,276.08	36,414.12
Rhode Island.....	1,131.92	1,697.88
South Carolina.....	29,732.48	44,598.72
South Dakota.....	12,216.22	18,324.33
Tennessee.....	37,391.94	56,087.91
Texas.....	74,682.38	112,023.57
Utah.....	5,251.84	7,877.76
Vermont.....	5,235.80	7,853.70
Virginia.....	35,572.28	53,358.42
Washington.....	14,757.86	22,136.79
West Virginia.....	26,906.72	40,360.08
Wisconsin.....	30,112.44	45,168.66
Wyoming.....	3,379.76	5,069.64
Total	1,200,000.00	1,800,000.00

(b) ADMINISTRATION OF GRANTS TO STATES AND COORDINATION OF RESEARCH

Appropriation Act, 1938	$161,735
Budget Estimate, 1939	161,735

PROJECT STATEMENT

Project	1937	1938 (Estimated)	1939 (Estimated)
Administration and coordination of Federal aid to agricultural experiment stations; assistance in coordination of research work of the Department; assistance in coordination of research work of the Department with that of the State stations; administration of Department insular stations; and preparation of "Experiment Station Record" and other publications....	$160,697	$161,735	$161,735
Unobligated balance.....	1,038	- - -	- - -
Total appropriation.....	161,735	161,735	161,735

CHANGES IN LANGUAGE

The Budget estimate provides for revision of the language of this item, as follows:

To enable the Secretary of Agriculture to enforce the provisions of the Acts approved March 2, 1887 [(U. S. C., title 7, secs. 362, 363, 365, 368, 377-379)] (7 U. S. C. 362, 363, 365, 368, 377-379), March 16, 1906 [(U. S. C., title 7, secs. 369, 375)] (7 U. S. C. 369, 375), February 24, 1925 [(U. S. C., title 7, secs. 361, 366, 370, 371, 373-376, 380, 382)] (7 U. S. C. 361, 366, 370, 371, 373-376, 380, 382), May 16, 1928 [(U. S. C., title 7, secs. 386-386b)] (7 U. S. C. 386-386b), February 23, 1929 [(U. S. C., title 7, sec. 386c)] (7 U. S. C. 386c), March 4, 1931 [(U. S. C., title 7, secs. 386d-386f)] (7 U. S. C. 386d-386f), and June 20, 1936 [(U. S. C., Supp. II, title 7, sec. 369a)] (7 U. S. C., Supp. II, 369a), and Acts amendatory or supplementary thereto, relative to their administration and for the administration of an agricultural experiment [stations] station in [Hawaii and] Puerto Rico, including the employment of [clerks, assistants, and other] persons and means in the city of Washington and else-

where, [freight and express charges, official traveling expenses, office fixtures, supplies, apparatus, telegraph and telephone service, gas, electric current, and rent outside the District of Columbia,] $161,735; and the Secretary of Agriculture shall prescribe the form of the annual financial statement required under the above Acts, ascertain whether the expenditures are in accordance with their provisions, coordinate the research work of the Department of Agriculture and coordinate the research work of the Department with that of the State agricultural colleges and experiment stations in the lines authorized in said Acts, and make report thereon to Congress.

One of the changes in the language of this item strikes out the authority for the administration of an agricultural experiment station in Hawaii, as no provision is included in the estimates for an experiment station in Hawaii under the direct supervision of this Office. The other changes amend the language to make it conform to the more generally accepted phraseology used elsewhere in the Appropriation Act by inserting the words "and means" and eliminating superfluous language comprehended by the term "means".

WORK UNDER THIS APPROPRIATION

The Office of Experiment Stations (a) represents the Department in the administration of the Acts of Congress making appropriations for the support of State and Territorial agricultural experiment stations in the several States, Hawaii, Alaska, and Puerto Rico (Hatch Act, Adams Act, Purnell Act, and the Hawaii, Alaska, and Puerto Rico Stations Acts); (b) assists in the coordination of the research work of the Department, the coordination of the research of the State agricultural experiment stations, and the coordination of the research work of the Department with that of the State agricultural colleges and experiment stations; and (c) administers the Federal agricultural experiment stations in Hawaii and Puerto Rico.

Administration of the Acts granting funds to States and Territories involves supervision of the funds, close advisory relations with the stations as to research for which the funds are expended, annual examination of the work and expenditures of each station, coordination of the research activities of the Department with those of State stations, preparation and issuance of the "Experiment Station Record" and other reports, and preparation of the annual report to Congress on the work and expenditures of the stations as called for in the Acts.

The Federal funds paid to the States and Territories are largely expended on research projects submitted to the Office of Experiment Stations for advisory suggestions and approval in advance of expenditures. Programs of projects with proposed expenditures under the Federal funds are submitted by each station for review and approval at the beginning of each fiscal year. Changes and adjustments in work to best meet State needs are submitted throughout the year. There were 2,108 active Adams and Purnell projects in 1937, of which 304 were new or revised during the year.

To carry out the provisions of the Federal Acts a representative, or representatives, of the Office visits each of the 50 State stations at least once annually and spends four to twenty-one days reviewing the expenditures and the research under way. In addition, staff members cooperate as specialists with

individual stations and regional groups in the consideration of research programs for special fields.

Coordinating the research of the Department of Agriculture with that of the State and Territorial stations and coordinating the research work among State stations is constantly in mind when the proposed research projects under Federal funds are reviewed for approval and when the work and expenditures of each station are reviewed and discussed with the State station directors and research staffs. Through personal conferences and committees having to do with research, close advisory relations are maintained with bureaus of the Department. Every opportunity is taken to promote effective cooperation between and among the State stations and between the State stations and the Department. During the fiscal year 1937 there were 1,188 cooperative agreements between State stations and the bureaus of the Department. These had been carefully planned by the cooperating agencies and written agreements signed. These agreements were reviewed and filed by the Office of Experiment Stations. The number of agreements entered into by individual stations ranged from 7 to 52.

The "Experiment Station Record" was established in 1889 as a part of the Federal-State joint participation in establishing and maintaining agricultural experiment stations. Its purpose is to make available promptly to staff members of all stations and the Department abstracts of current published results of research in this and other countries as an aid in planning research, avoiding duplication, and coordinating research effort. A total of about 7,000 such abstracts are prepared, edited and published annually, involving translations from twelve or more languages. The abstract volumes are supplemented by indexes and a combined index is published for each ten volumes. Few, if any, of the stations have all the publications available, and the abstracting done by the Office of Experiment Stations avoids the necessity of duplicate abstracting by the several thousand research workers. As a part of this function the Office represents the Department's cooperation with "Biological Abstracts" to the extent of furnishing copies of abstracts of publications by the State stations and the Department.

As a central agency for the State stations the Office of Experiment Stations compiles lists of research projects in special fields, maintains an up-to-date list of the organization and personnel of the several stations and publishes a revised list annually, issues a monthly mimeographed list of new station publications, and prepares other lists and compilations of information.

The Office also answers a very large volume of inquiries from all parts of the world regarding the organization, personnel, relationships, and work of the State stations and agricultural conditions and possibilities in Hawaii, Alaska, Guam, the Virgin Islands, and Puerto Rico.

Assistance in coordinating the research work of the Department of Agriculture is accomplished through advising with the bureau chiefs and the Secretary of Agriculture with regard to the coordination and correlation of proposed research. Special attention is given to adjustments of closely related research in different bureaus and to the coordination and integration of any new research with existing activities of the Department. The Office of Experiment Stations is responsible for the development of the programs, for presentation to the Secretary, for work to be undertaken by the bureaus of the Department under special research projects and at the special research laboratories in the major agricultural regions provided for by Title I of the Bankhead-Jones Act, for general assistance in the planning,

directing, and supervising the work, and for the administration of the funds. In connection with other funds of the Department, the Chief of the Office participates in the preparation of research programs and budget estimates, especially in regard to coordination and cooperation, and serves on some 12 committees having to do primarily with policy, coordination, and cooperation in research.

Administration of the Federal stations in Puerto Rico and Hawaii involves approval of budgets, expenditures, and research projects; the review, editing, and approval of publications; and general administrative direction. During the past few years there has developed, in addition, a responsibility for coordination of these Federal stations and their work with the Territorial experiment stations and their research. Hawaii, under the Hawaii Station Act of May 16, 1928, and Puerto Rico, under the Puerto Rico Station Act of March 4, 1931, now receive the benefit of the funds under the Hatch and supplemental Acts. The Acts granting these funds to the Territories, however, provide that the Secretary of Agriculture shall coordinate the work of the Territorial stations and the work of the Federal stations.

In addition to the regular appropriations for the Federal Hawaii and Puerto Rico stations, the President approved on April 24, 1935, one Sugar Processing Tax Order allotting $113,000 to the Puerto Rico station and between August 21 and October 24, 1935, seven such orders allotting a total of $410,000 to the Hawaii station. These allotments were continued by the Supplemental Appropriation Act, fiscal year 1936 (49 Stat., 1116). The funds are available until expended. At the end of the fiscal year 1937 approximately $106,125 of the allotment to the Puerto Rico station and $328,600 of the allotments to the Hawaii station had been expended. It is expected that the balances will be expended during the fiscal year 1938.

(c) INSULAR EXPERIMENT STATIONS

Appropriation Act, 1938.....	$69,311
Budget Estimate, 1939.....	67,245
Decrease.....	2,066

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Decrease
1. Federal Experiment Station in Hawaii.....	$12,023	$2,066	- - -	- $2,066(1)
2. Federal Experiment Station in Puerto Rico.....	56,950	67,245	$67,245	- - -
Unobligated balance.....	338	- - -	- - -	- - -
Total appropriation.....	69,311	69,311	67,245	- 2,066

DECREASE

(1) A decrease of $2,066 in the appropriation for the Federal Experiment Station in Hawaii, which eliminates this item. This action is in accordance with the policy followed in recent years of reducing the appropriation for the Federal Experiment Station in Hawaii under this item as Federal grant funds are made to Hawaii in accordance with the authorizations under the Hawaii Station Act of 1928, ultimately consolidating the independent Federal station with the insular government station which receives the funds under the grant acts. In accordance with this policy and in view of the increase in the Federal-grant funds authorized and estimated for the fiscal year 1939, it is proposed to discontinue the item for support of a Federal independent station in Hawaii.

CHANGES IN LANGUAGE

The Budget estimates provide for amendment of the language of this paragraph, as follows:

> To enable the Secretary of Agriculture to establish and maintain an agricultural experiment [stations] station in [Hawaii and] Puerto Rico, including the erection of buildings, the preparation, illustration, and distribution of reports and bulletins, [and all other necessary expenses, $69,311, as follows: $2,066 for Hawaii, and $67,245 for Puerto Rico] $67,245: Provided, That the Secretary of Agriculture may, at his discretion, transfer such property and equipment, including the library, of the Hawaii Experiment Station, formerly maintained by the Department of Agriculture, as he may deem necessary and advisable to the experiment station of the University of Hawaii, which has been conducted jointly and in collaboration with the former Federal station under the Act of May 16, 1928 [(U. S. C., title 7, secs. 386-386b)] (7 U. S. C. 386-386b); and the Secretary of Agriculture is authorized to sell such products as are obtained on the land belonging to the agricultural experiment [stations] station in [Hawaii and] Puerto Rico, and the amount obtained from the sale thereof shall be covered into the Treasury of the United States as miscellaneous receipts.

Two changes are proposed in the language of this item. The first strikes out the authority and the appropriation for maintaining a Federal agricultural experiment station in Hawaii. The policy has been followed for several years of reducing the appropriation for the Hawaii station under this item as increases are made to Hawaii under the Act of May 16, 1928, under the subappropriation, Payments to States, Hawaii, Alaska, and Puerto Rico for agricultural experiment stations. In accordance with this policy, no estimate has been made for an appropriation for the Hawaii station under this item for the fiscal year 1939. With the omission of the Hawaii station in this item, that station will no longer be maintained as an independent station of the Department for the benefit of Hawaiian agriculture. The maintenance and use of a portion of the land and buildings, either through direct control or through cooperative arrangement with the agricultural experiment station of the University of Hawaii, will be necessary to provide such facilities of the station as may be needed and available for investigations by the Bureau of Entomology and Plant Quarantine primarily in connection with the control of fruit fly.

The second change in language in this item is for the purpose of granting the Secretary of Agriculture authority to transfer property of the former Federal Hawaii station to the experiment station of the University of Hawaii, which has been conducted jointly and in collaboration with the Federal station in accordance with the Act of May 16, 1928. This proposed action is in accordance with the plan of ultimately consolidating the independent Federal station with the station of the University of Hawaii. With the gradual decrease in appropriations for the Federal station in the past few years, transfers of certain equipment, including part of the library, were made in the fiscal years 1936 and 1937, and other transfers will be made in the fiscal year 1938, to the experiment station of the University of Hawaii in accordance with authority contained in the appropriation acts for these years. It is desired that this language be retained in the 1939 appropriation bill and that the proposed addition of authority for transferring property be included to permit transfer of property and equipment not needed by the Department after the Department no longer maintains an independent station for the benefit of Hawaiian agriculture. The equipment that would be transferred is of a character that it would not be desirable or economical to transfer it to the continental United States.

WORK UNDER THIS APPROPRIATION

General.--This appropriation provides (a) through the fiscal year 1938, for the maintenance of a Federal experiment station in Hawaii to conduct investigations for the improvement and diversification of Hawaiian agriculture; and (b) for the maintenance of a Federal agricultural experiment station in Puerto Rico to serve as a tropical outpost station of the Department and to conduct investigations, to a certain extent, for the benefit of Puerto Rican agriculture. The Hawaii Station Act (Act of May 16, 1928) and the Puerto Rico Station Act (Act of March 4, 1931) provide for the coordination of the Federal stations and their work with the stations of the Hawaii and Puerto Rico agricultural colleges.

1. Federal Experiment Station in Hawaii.--This station at Honolulu, which is maintained in cooperation with the University of Hawaii, is concerned with problems relating to the diversification of agriculture and the establishment of industries other than sugar and pineapple production. These major industries have their own experiment stations, but close cooperation is maintained with them on problems of mutual interest. The principal activities of the station are studies designed to aid the so-called small farmer as contrasted with the plantation system.

Between August 21 and October 24, 1935, the President approved seven Sugar Processing Tax Orders allotting a total of $410,000 to the Hawaii Agricultural Experiment Station of the Department. The allotments were continued by the Supplemental Appropriation Act, fiscal year 1936 (49 Stat., 1116), and are available until expended. These allotments are for taro investigations, liver fluke eradication, a rat-abatement program, development of truck farming and improvement of marketing facilities, development of livestock feed, development of tropical fruits and nuts, and promotion of the poultry industry. The work under the several allotments is being carried out on plans agreed upon by the Hawaiian Agricultural Advisory Committee, the Directors of the Federal and Territorial Agricultural Experiment Stations, and the Chief of the Office of Experiment Stations. During the fiscal year 1937 approximately $204,400 of these funds were expended. The several lines of work will be continued through at least part of the fiscal year 1938.

2. Federal Experiment Station in Puerto Rico.--The agricultural experiment station maintained by the Department at Mayaguez, Puerto Rico, since 1902, was established to aid in the improvement and diversification of agriculture in the island.

Since 1935, the Agricultural Experiment Station of the University of Puerto Rico has been receiving gradually increasing Federal grants for agricultural research under the Puerto Rico Station Act of 1931. In accordance with the provisions of this Act, the work of the Federal and the University of Puerto Rico stations is coordinated. The Federal grants to the University of Puerto Rico station are enabling it to gradually assume increasing responsibility for needed research on the problems of concern to Puerto Rico alone. For a few years (until the University of Puerto Rico station is prepared to take them over) the Department, through its station at Mayaguez, Puerto Rico, will need to continue some lines of investigations for which Puerto Rican agriculture has relied almost wholly upon the Federal station, especially in problems of sugar production, coffee production, animal diseases and parasites, and the introduction of new crop plants.

This change in policy has made possible the designation of the Federal Experiment Station at Mayaguez as a Federal tropical station of the Department of Agriculture, where all bureaus of the Department may be provided with facilities for study of problems requiring or profiting by research under tropical conditions.

The new policy of maintaining the Mayaguez station mainly as a Federal outpost station of the Department contemplates that a physical plant, including offices, laboratories, houses, and farm equipment, as well as assistance in the carrying out of some phases of the investigations, will be made available by the station. This will provide a station for use by experts of the Department in many lines without the maintenance of separate physical plants and without the necessity of many agencies arranging for their own facilities at considerable expense due to delays and time involved in becoming acquainted with local conditions. During the fiscal year 1937 the Bureaus of Animal Industry and Entomology and Plant Quarantine and the Soil Conservation Service of the Department of Agriculture and the Puerto Rico Reconstruction Administration of the Department of the Interior have maintained activities at Mayaguez, using the facilities of the experiment station.

The work of the Puerto Rico station includes:

(a) Introduction and investigation of important drug plants, especially chincona. The work with chincona, which is the source of commercial quinine, is for the purpose of studying the possibility of developing a supply of quinine in case the present market sources are closed.

(b) Introduction and investigation of insecticidal plants. The matter of developing insecticides and fungicides for controlling insect pests and diseases is a major problem in the United States. These studies at the Puerto Rico station are concerned particularly with the production of plants which are sources of rotenone, an insecticidal material nontoxic to human beings.

(c) Breeding work with vegetables for the production of improved varieties for the continental United States. With the twelve months growing season in Puerto Rico, such work can be pursued more rapidly there and, for example, cross-pollinations can be made on sweetpotatoes which do not flower in the continental United States.

(d) Plant introductions and maintenance of an extensive collection of tropical and subtropical plants. These introductions and collections hold possibilities of crop improvement for sections of subtropical agriculture in the United States.

(e) Entomological work to control insect pests. This work is conducted under the technical supervision of the Bureau of Entomology and Plant Quarantine.

Under Puerto Rico Tax Fund Order No. 5, approved April 24, 1935 by the President, $113,000 was transferred to the Federal Experiment Station in Puerto Rico for experimentation in the propagation and breeding of tropical plants and studies of domestic animal parasites. This allotment was continued under the Supplemental Appropriation Act, fiscal year 1936, and is available until expended. Six lines of work were set up under these funds, as follows: Drug and insecticidal plants; bamboo utilization and propagation; tropical economic plant introductions and investigations; tropical field crops; tropical horticultural crops; and animal parasitology. The work was begun in 1935 and by the end of the fiscal year 1937 approximately $106,125 had been expended. Only approximately $6,875 of these funds is available for the fiscal year 1938, after which they will be exhausted.

The work conducted in Puerto Rico for the benefit of the agriculture of the continental United States is also helpful to Puerto Rico, partly in solving its local agricultural production problems, and partly, perhaps, in developing new intensive industries, such as drug and insecticidal plants, to supply needs in the United States.

With the discontinuance of the Federal Experiment Station in Hawaii at the close of the fiscal year 1938, all the Federal stations formerly maintained in Alaska, Guam, Hawaii, and the Virgin Islands will have been closed and the only Department Station remaining will be the Puerto Rico station. The maintenance of one Department outpost station in the Tropics in behalf of agriculture of the continental United States will facilitate the research work of a number of bureaus of the Department.

A. A. A. FUNDS

Projects	Obligated 1937	Estimated obligations, 1938
Agricultural Adjustment Administration (Payments for Agricultural Adjustment):		
Federal Experiment Station in Hawaii:		
Taro Investigations.....	$17,805	$ 5,732
Liver Fluke Eradication.....	14,439	12,073
Rat Abatement Campaign.....	66,593	4,336
Development of Truck Farming and Improvement of Marketing Facilities.	31,560	11,250
Development of Livestock Feed.....	33,451	25,652
Development of Tropical Fruits and Nuts	28,924	9,643
Promotion of the Poultry Industry.....	11,642	12,714
Federal Experiment Station in Puerto Rico:		
Experimentation in the propagation and breeding of tropical plants and studies of domestic animal parasites.	33,595	6,875
Total.....	238,009	88,275

PASSENGER- CARRYING VEHICLES

The authorization for the purchase of passenger-carrying vehicles for the Office of Experiment Stations contemplates an increase of $25 ($725 in 1938, $750 estimated for 1939). This $750 will permit the needed purchase of one new vehicle which is essentially a replacement. In the fiscal year 1939 a 1933 passenger-carrying automobile will be retired from service, dismantled, and the parts used as spare parts. It is felt that this disposition of the old car will be more economical than trading it in on the new car for an estimated allowance of $75.

The automobile is needed to afford facilities for the research staff of the Federal Experiment Station in Puerto Rico in conducting the work jointly and in coordination with that of the experiment stations of the College of Agriculture of the University of Puerto Rico, as required by law. The investigations are located at the Federal station at Mayaguez, the insular stations at Rio Piedras and Isabela, the insular demonstration farms, and other places in the island. The carrying on of the joint research necessitates frequent trips of the Director and other members of the technical staff from Mayaguez to the other stations and to points throughout the island. The poor transportation facilities in Puerto Rico make it essential that automobiles be available so that the research work throughout the island will not be impeded.

The automobile to be retired from service is a 1933 model which has been operated under conditions of use ranging from city streets to the rough country roads of Puerto Rico. With more frequent repair bills operating costs are increasing on this automobile to such an extent that at least by the fiscal year 1939 it will be more economical to purchase a new vehicle, as herein provided.

SPECIAL RESEARCH FUND, DEPARTMENT OF AGRICULTURE

Appropriation Act, 1938.....	1,200,000
Budget Estimate, 1939.....	1,200,000

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
1. Administration of payments to States under Title I, Bankhead-Jones Act.....	$15,975	$24,000	$24,000
2. Special research projects, Department of Agriculture.....	366,051	576,000	576,000
3. Special research laboratories in major agricultural regions.....	396,503	600,000	600,000
Unobligated balance.....	21,471	---	---
Total appropriation.....	800,000	1,200,000	1,200,000

WORK UNDER THIS APPROPRIATION

General.--The "Special research fund, Department of Agriculture", authorized in sections 3 and 4, Title I, of the Bankhead-Jones Act (approved June 29, 1935), provides for (1) administration of the provisions of the Act authorizing payments to States, Hawaii, Alaska, and Puerto Rico for research to be conducted by agricultural experiment stations; (2) special research projects approved by the Secretary of Agriculture and conducted by such agencies of the Department of Agriculture as the Secretary may designate or establish; and (3) the establishment and maintenance of research laboratories and facilities in major agricultural regions of the United States and the prosecution of research at such laboratories. Section 1 of the Act (see Office of Experiment Stations for digest of Title I) specifies that the work conducted under the Special Research Fund shall be "research into laws and principles underlying basic problems of agriculture in its broadest aspects; research relating to the improvement of the quality of, and the development of new and improved methods of production of, distribution of, and new and extended uses and markets for, agricultural commodities and by-products and manufactures thereof; and research relating to the conservation, development, and use of land and water resources for agricultural purposes."

1. Administration of Payments to States under Title I, Bankhead-Jones Act.--The administration of the provisions of the Act, which authorize allotments to the States, Territories, and Puerto Rico, is conducted along the same general lines as that of the previous Acts granting funds to the State experiment stations for research work (Hatch, Adams, and Purnell Acts). Such administration includes examination and approval of research projects in advance of the expenditure of funds, review of the work and expenditures at each station as a basis for certifying the respective States, Territories, or Puerto Rico to receive Federal funds, assistance

in coordinating the research of the various stations and the research of the stations with that of the Department, reporting annually to the Secretary and the Congress on the work and expenditures under the Act, and close advisory relations with the State, Territorial, and Puerto Rican stations. During the fiscal year 1937 there were 511 active Bankhead-Jones projects, of which 194 were new or revised.

Administration of the payments to States authorized by the Bankhead-Jones Act differs from administration of the other Acts on a number of points including the following:

(a) No allotment of Bankhead-Jones funds can be made to a State, Territory, or Puerto Rico in excess of the amount the State, Territory, or Puerto Rico makes available from other than Federal funds for research during the year. The other Acts do not require the Federal funds to be matched by the States. Enforcement of this provision requires not only annual administrative examination of the work and expenditures under the allotments under the Bankhead-Jones Act, but also annual administrative examination of the work and expenditures under an equal amount of funds made available by the States from other than Federal sources and advanced for offset credit. In 1938 it will be necessary to examine the work and expenditures made under the Bankhead-Jones allotments totaling $1,800,000 and to examine State accounts also totaling $1,800,000.

(b) As a part of their research offset, the States, Territories, and Puerto Rico may include expenditures during the year for physical plant and equipment necessary for the prosecution of research. This provision requires administrative responsibility to ascertain that expenditures for physical plant and equipment advanced for offset credit are necessary for research purposes.

(c) Under the terms of the Bankhead-Jones Act the funds authorized by the Act may be used for physical plant, including the purchase and rental of land, construction of buildings, and for the equipment and maintenance of such buildings without limitation as to the portion of the funds which may be used for these purposes. The expenditures, however, are limited to those necessary for the research under this Act. Administration of this provision is an important responsibility in addition to those required under the other Acts.

2. Special Research Projects, Department of Agriculture.--Approximately one-half of the Special Research Fund is available to the Secretary of Agriculture for financing such research projects as he may authorize, within the scope set forth by Section 1 of the Act. The work under this head includes planning, programming, coordinating, and the carrying out of such special research projects as the Secretary may authorize to be undertaken under this fund in a way to effectively integrate this research with research and other activities provided for in the regular appropriations to the Department. The Act requires that the research under this fund "shall be in addition to research provided for under existing law (but both activities shall be coordinated as far as practicable) and shall be conducted by such agencies of the Department of Agriculture as the Secretary may designate or establish".

All the bureaus of the Department cooperate in bringing before the Secretary problems suitable for research under the provisions of the Bankhead-Jones Act. From the combined suggestions and recommendations, the Secretary, with such advisory assistance as he may call for, selects the problems for

research. These problems are assigned to a bureau, or bureaus, or to a group of specialists, for development of plans and estimates for the consideration of the Secretary before final decision is made as to the research to be undertaken. The projects finally decided upon are assigned to an existing bureau, or bureaus, along with an allotment of funds to each bureau. A written project is prepared outlining the research to be undertaken and submitted for approval by the Secretary as required by the Act.

The Office of Experiment Stations is responsible for the development of the program for presentation to the Secretary, for general assistance in planning, directing, and supervising the work, and for the administration of the funds in accordance with the provisions of the Act. A total of 35 projects involving 11 bureaus are under way in 1938. As many as 3 bureaus and 7 State stations are involved in a single project in an effort to coordinate the work with research provided for by other funds as specified in the Act.

3. Special Research Laboratories in Major Agricultural Regions.--The Bankhead-Jones Act provides that the Secretary of Agriculture shall use one-half of the Special Research Fund for the establishment and maintenance of research laboratories and facilities, and for research as described by the Act at such laboratories, located at places selected by the Secretary in major agricultural regions. The work under this item involves decision as to problems for which laboratories should be established and planning the research program for each such laboratory; the working out of relationships with the State experiment stations in the major agricultural region having such a laboratory, or where such a laboratory is proposed, in order to coordinate this work with work under regular Federal and State activities; and carrying forward the research program finally approved.

The general plan is to secure from the directors of State experiment stations and the chiefs of bureaus in the Department suggestions as to such laboratories. With this information available the Secretary, with such assistance as he may call for, decides upon the laboratory projects to be undertaken and the agencies of the Department to which the responsibility for each laboratory and the research work will be assigned. It is contemplated that such laboratories will be established and operated in a way that the research undertaken, as far as practicable, will be coordinated with the regular activities of the Department and the work of the State experiment stations.

Six regional laboratories have been initiated under this project, with all the State stations of each region and the pertinent subject-matter bureau or bureaus of the Department participating in the work of each laboratory, as follows: (1) A laboratory for research into the heredity and behavior of vegetable crop plants for the development of improved varieties having superior adaptation to the Southeastern region; (2) one for the study of the mechanism of infection in the contagious, infectious, and parasitic diseases of domestic animals and poultry, and methods of control in the Southeastern region; (3) one for research into laws and principles underlying pasture improvement in the Northeastern region; (4) a laboratory for research into the industrial utilization of the soybean and soybean products in the North-Central region; (5) one for research on the improvement of swine through the application of breeding methods in the North-Central region; and (6) a regional research laboratory for the improvement of sheep for Western ranges through the application of breeding methods for the far Western region. In addition to maintaining the laboratories already established, plans are under way for two or three additional laboratories to be established during 1938.

The Office of Experiment Stations is responsible for the development of the laboratory programs, in cooperation with bureaus and State stations, to be presented for the consideration of the Secretary, for assistance in the general planning of the work and the development of effective relationships at each laboratory and for the administration of the laboratories in accordance with the terms of the Act.

PASSENGER-CARRYING VEHICLES

The activities under the Special Research Fund are in the process of development so that it is not possible to state definitely exactly how many passenger automobiles will be required in any one fiscal year. At the time the 1938 budget was submitted, an estimate for the purchase of twelve passenger automobiles was included for the activities under the Special Research Fund. It now appears that during the current year only five passenger automobiles will be purchased, one for regional laboratory projects under Section 4 of the Bankhead-Jones Act and four for projects under Section 1. In connection with the program of work for 1939, the best estimate that can be made at this time is five new vehicles for regional laboratories and three new vehicles for research projects under this fund. If the establishment of new laboratories proceeds to such an extent in 1938 that more than one vehicle is purchased, the number estimated to be purchased in 1939 will be decreased accordingly. In other words, it is not expected that more than thirteen passenger automobiles will be purchased during the fiscal years 1938 and 1939 for activities under the Special Research Fund. The estimate for 1939 represents the maximum number of passenger automobiles expected to be purchased in that year. All cars purchased are, of course, subject to the limit of $750 maximum cost applicable to the Government as a whole.

At least one car is essential for each regional laboratory to enable the technical men to visit the different parts of the region, including the State experiment stations located therein, all of which are cooperating in the laboratory projects of their region. In the case of laboratories established in the larger regions covering a wide area and including the work of more than one bureau, two or more cars may be required to enable the technical men to visit the different parts of the region. Automobile transportation is also necessary in connection with field projects conducted under this fund in the case of those investigations for which common carriers are not available, are impracticable, or are less economical.

EXTENSION SERVICE

Payments to States, Hawaii, Alaska, and Puerto Rico
for Agricultural Extension Work.

General Statement

As shown by Table 1, on the following page, funds available in 1938 for direct payments to the States, Hawaii, Alaska, and Puerto Rico for cooperative agricultural extension work total $17,490,083. In addition, there was available $50,540 from an appropriation direct to the Department of Agriculture ("Cooperative Farm Forestry Extension Work"), making a grand total of $17,540,623 available to the States and Territories for 1938. As shown also by Table 1, the Budget estimates for 1939 provide for total appropriations of $18,117,043 for these purposes, involving a net increase of $576,420, as compared with 1938. The increases and decreases in various appropriation items are discussed on succeeding pages.

With the exception of the $11,000,000 estimated for under the item "Extension Work, section 21, Bankhead-Jones Act", to augment the cooperative agricultural extension funds, the $250,000 designated for "Additional Cooperative Extension Work", and $181,460 to be allotted to the States by the Department under "Cooperative Farm Forestry Extension Work", the major part of extension funds are distributed on the basis of rural population. The funds under "Extension Work, section 21, Bankhead-Jones Act" (with the exception of $20,000 to each State and Hawaii) are allotted on the basis of farm population. The $250,000 under "Additional Cooperative Extension Work" specifies payment to each State and the Territory of Hawaii in accordance with the apparent need as determined by the Secretary of Agriculture. Funds for "Cooperative Farm Forestry Extension Work" are directly disbursed by the Department and are also allotted at the discretion of the Secretary.

The use of all of these funds is indicated in greater detail in Tables 1, 2, 3, 4, and 5. Table 1 is a summary of all of the funds. Table 2 indicates the funds paid to the States and Territories which require offset by State, county, or local funds, those where such offset is not required, and the basis of allotment. Table 3 shows, by States, the allotments for direct payment to States for 1938 and for 1939 as contemplated by the Budget estimate. Table 4 shows, by States, Federal funds and funds arising from sources within the respective States. Table 5 shows the various classes of field agents employed with extension funds.

Table 1.

Statement showing appropriation items and amounts available to the States in 1938 and estimated for 1939.

	Appropriation, 1938	Budget estimate, 1939	Increase or decrease
Payments to States, Hawaii, Alaska and Puerto Rico for agricultural extension work:			
Permanent Specific Appropriation:			
Smith-Lever Act.....	$4,701,165	$4,701,165	- - -
Agricultural Appropriation Act:			
Capper-Ketcham extension work.....	1,480,000	1,480,000	- - -
Extension work, Section 21, Bankhead-Jones Act.....	10,000,000	11,000,000	+1,000,000(1)
Alaska.....	18,918	21,418	+ 2,500(2)
Puerto Rico.....	- - -	88,000	+88,000(3)
Supplementary cooperative extension work.....	790,000	395,000	-395,000(4)
Additional cooperative extension work.....	500,000	250,000	-250,000(5)
Total, Agricultural Appropriation Act	12,788,918	13,234,418	+445,500
Total payments made directly to States and Territories.....	17,490,083	17,935,583	+445,500
Amounts allotted to States and Territories but disbursed by Department of Agriculture:			
Cooperative Farm Forestry Extension Work: Extension activities in farm forestry.....	50,540	181,460	+130,920(6)
Total direct payments and Department allotments to States and Territories	17,540,623	18,117,043	+576,420

(1) $1,000,000 increase in direct payments to States and Hawaii, as authorized for 1939 by Section 21 of the Bankhead-Jones Act, (7 U.S.C., Supp. II, 343c).
(2) $2,500 increase for Alaska, as authorized for 1939 by the Act of June 20, 1936 (7 U.S.C., Supp. II, 343e).
(3) $88,000 increase for Puerto Rico, as authorized for 1939 by the Act of August 28, 1937 (50 Stat. 881).
(4) $395,000 decrease in direct payments to the States and Hawaii.
(5) $250,000 decrease in direct payments to the States and Hawaii.
(6) $130,920 increase in State allotments disbursed by the Department of Agriculture as follows:
$42,520 increase under Sec. 5 of the Clarke-McNary Forestry Act of June 7, 1924 (16 U.S.C. 564-570).
88,400 increase under the provisions of the Cooperative Farm Forestry Act of May 18, 1937 (50 Stat. 188).

Table 2.

Statement of direct payments to States, Hawaii, Alaska, and Puerto Rico, indicating those requiring offset by States and Territories, those not requiring such offset, and basis of distribution, as estimated for 1939.

Item	Total estimate, 1939	Amount to be paid without offset	Amount requiring offset and basis of allotment	
			Amount	Basis of distribution
(1) Permanent annual appropriation (Smith-Lever Act).....	$4,701,165	$ 500,000(a)	$4,201,165	Rural population
(2) Supplementary cooperative extension work	395,000	- - -	395,000	" "
(3) Capper-Ketcham extension work.....	1,480,000	980,000(b)	500,000	" "
(4) Extension work, section 21, Bankhead-Jones Act	11,000,000	11,000,000(c)	- - -	Farm population
(5) Alaska.....	21,418	17,500(d)	3,918	Rural population
(6) Puerto Rico.....	88,000	88,000	- - -	Flat payment
(7) Additional cooperative extension work.....	250,000	250,000	- - -	Determined by Secretary of Agriculture
Total, direct Federal payments.....	17,935,583	12,835,500	5,100,083	

(a) $10,000 to each State, Hawaii, and Puerto Rico.
(b) $20,000 to each State and Hawaii.
(c) $20,000 to each State and Hawaii (balance, based on farm population)
(d) $10,000 to Alaska (Act of February 23, 1929).
7,500 to Alaska (Act of June 20, 1936).

Funds from other sources

The Federal funds for cooperative agricultural extension work are supplemented by funds from within the States estimated at $13,485,899.32, thus making available from Federal, State, and local sources for extension work during 1938 a sum approximating $31,026,522. (See Table 4).

Table 3.

DIRECT PAYMENTS TO STATES

FEDERAL FUNDS FOR COOPERATIVE AGRICULTURAL EXTENSION WORK*

State	Appropriation 1938	Budget Estimate 1939	Increase or decrease
Alabama	$635,290.91	$665,176.87	$ 29,885.96
Arizona	116,961.84	116,107.52	-854.32
Arkansas	537,155.08	552,972.73	15,817.65
California	389,615.94	393,801.95	4,186.01
Colorado	211,270.25	209,639.38	-1,630.87
Connecticut	129,810.97	128,822.50	-988.47
Delaware	75,242.42	75,920.25	677.83
Florida	219,399.72	218,235.74	-1,163.98
Georgia	683,457.88	701,088.29	17,630.41
Idaho	154,182.28	152,980.01	-1,202.27
Illinois	557,587.65	562,151.78	4,564.13
Indiana	444,939.00	449,955.83	5,016.83
Iowa	495,442.24	508,488.28	13,046.04
Kansas	389,345.23	390,285.57	940.34
Kentucky	578,385.75	603,553.18	25,167.43
Louisiana	430,661.06	439,528.96	8,867.90
Maine	156,011.15	155,518.80	-492.35
Maryland	195,281.56	194,739.36	-542.20
Massachusetts	137,165.77	136,335.65	-830.12
Michigan	434,686.33	448,989.16	14,302.83
Minnesota	446,571.00	464,274.41	17,703.41
Mississippi	618,828.27	651,140.29	32,312.02
Missouri	565,568.10	579,039.79	13,471.69
Montana	173,671.83	172,399.74	-1,272.09
Nebraska	343,644.71	342,761.17	-883.54
Nevada	73,107.77	71,531.21	-1,576.56
New Hampshire	93,154.24	92,402.53	-751.71
New Jersey	171,082.26	169,332.86	-1,749.40
New Mexico	142,417.10	141,286.20	-1,130.90
New York	477,192.52	477,310.10	117.58
North Carolina	757,679.43	792,697.00	35,017.57
North Dakota	247,870.38	247,102.02	-768.36
Ohio	562,655.40	580,120.65	17,465.25
Oklahoma	519,322.86	531,272.54	11,949.68
Oregon	136,845.64	134,761.05	-2,084.59
Pennsylvania	614,926.90	617,770.48	2,843.58
Rhode Island	60,065.54	60,223.24	157.70
South Carolina	457,933.95	476,878.98	18,945.03
South Dakota	259,821.17	257,562.11	-2,259.06
Tennessee	588,293.40	607,436.19	19,137.79
Texas	1,096,956.21	1,138,696.81	41,740.60
Utah	120,972.95	119,887.50	-1,085.45
Vermont	112,671.29	111,949.46	-721.83
Virginia	510,165.84	513,017.26	2,851.42
Washington	218,530.98	218,124.73	-406.25
West Virginia	308,694.85	311,820.34	3,125.49
Wisconsin	448,245.03	466,905.12	18,660.09
Wyoming	108,513.71	106,567.22	-1,946.49
Alaska	18,918.00	21,418.00	2,500.00
Hawaii	118,794.31	122,532.86	3,738.55
Puerto Rico	95,069.00	183,069.00	88,000.00
Total	17,490,082.67	17,935,582.67	445,500.00

*Excludes Farm Forestry allotments: 1938, $50,540; Budget Estimate 1939, $181,460.

Table 4. Total allotments to States and Territories from Federal (including U.S.D.A.) and State sources for extension work, fiscal year 1938.

State	Total	Total Federal funds	Total within the States
Alabama	$967,210.91	$636,910.91	$330,300.00
Arizona	168,741.84	116,961.84	51,780.00
Arkansas	839,895.08	537,155.08	302,740.00
California	972,570.50	391,235.94	581,334.56
Colorado	356,250.25	212,170.25	144,080.00
Connecticut	301,131.97	130,830.97	170,301.00
Delaware	95,856.95	75,242.42	20,614.53
Florida	420,099.72	219,399.72	200,700.00
Georgia	1,023,297.00	685,077.88	338,219.12
Idaho	273,978.15	155,802.28	118,175.87
Illinois	1,114,429.09	559,207.65	555,221.44
Indiana	946,257.89	446,559.00	499,698.89
Iowa	1,114,783.23	497,062.24	617,720.99
Kansas	786,187.74	390,365.23	395,822.51
Kentucky	854,297.75	578,385.75	275,912.00
Louisiana	709,612.37	432,281.06	277,331.31
Maine	238,587.22	156,011.15	82,576.07
Maryland	376,343.27	196,901.56	179,441.71
Massachusetts	488,777.95	138,785.77	349,992.18
Michigan	789,706.33	436,306.33	353,400.00
Minnesota	705,126.82	448,191.00	256,935.82
Mississippi	949,742.27	620,448.27	329,294.00
Missouri	742,689.38	565,568.10	177,121.28
Montana	352,841.83	174,471.83	178,370.00
Nebraska	639,555.71	345,264.71	294,291.00
Nevada	137,527.77	73,107.77	64,420.00
New Hampshire	226,274.24	94,774.24	131,500.00
New Jersey	419,792.36	172,702.26	247,090.10
New Mexico	271,314.45	142,417.10	128,897.35
New York	1,693,194.85	478,812.52	1,214,382.33
North Carolina	1,139,635.25	759,299.43	380,335.82
North Dakota	402,615.38	249,130.38	153,485.00
Ohio	1,006,547.40	564,095.40	442,452.00
Oklahoma	813,942.86	519,322.86	294,620.00
Oregon	499,100.00	186,845.64	312,254.36
Pennsylvania	1,038,163.90	616,186.90	421,977.00
Rhode Island	81,293.77	60,065.54	21,228.23
South Carolina	622,912.83	457,933.95	164,978.88
South Dakota	323,347.90	259,821.17	63,526.73
Tennessee	859,546.40	589,918.40	269,628.00
Texas	1,856,962.97	1,098,576.21	758,386.76
Utah	196,766.95	122,052.95	74,714.00
Vermont	210,691.29	114,291.29	96,400.00
Virginia	869,668.84	511,785.84	357,883.00
Washington	286,453.68	218,530.98	67,922.70
West Virginia	487,848.85	310,314.85	177,534.00
Wisconsin	738,328.03	449,865.03	288,463.00
Wyoming	193,110.27	109,773.71	83,336.56
Alaska	24,918.00	18,918.00	6,000.00
Hawaii	158,023.65	118,794.31	39,229.34
Puerto Rico	240,568.88	96,689.00	143,879.88
Total	31,026,521.99	17,540,622.67	13,485,899.32

As the major purpose of these payments of money to States is the employment of extension workers in counties and colleges, the following comparative statement is submitted showing agents employed:

Table 5. Extension field agents employed June 30, 1933, 1934, 1935, and 1936, and October 31, 1937.

	June 30, 1933	June 30, 1934	June 30, 1935	June 30, 1936	Oct. 31, 1937
State Supervisors.....	475	512	539	621	630
Subject-Matter Specialists:					
Full-time specialists.....	863	853	860	1,087	1,163
Part-time specialists.....	216	258	306	341	353
Special A.A.A. State workers..	-	-	95	18	-
Total specialists.....	1,079	1,111	1,261	1,446	1,516
Total with headquarters at colleges.....	1,554	1,623	1,800	2,067	2,146
County Workers:					
Agricultural agents.....	2,450	3,167	3,290	3,636	3,817
Home demonstration agents.....	1,221	1,267	1,309	1,688	1,840
Boys' and girls' club agents..	201	185	244	315	276
Negro extension agents.....	314	307	326	396	435
Special A.A.A. county workers.	-	-	889	623	615
Total county workers.....	4,186	4,926	6,058	6,658	6,983
Total.....	5,740	6,549	7,858	8,725	9,129

Number of counties in United States..... 3075
Approximate number of counties now having one or more agents.... 2950

A discussion of the activities under the various appropriation items and tabulation of amounts involved, follows.

PAYMENTS TO STATES, HAWAII, ALASKA, AND PUERTO RICO

Change in Language

It is recommended that the language of this appropriation title be amended to include reference to Puerto Rico, as the Act "to extend the benefits of section 21 of the Bankhead-Jones Act to Puerto Rico", approved August 28,

1937 (50 Stat. 881), authorizes payments to Puerto Rico to provide for the further development of cooperative agricultural extension work.

(a) SUPPLEMENTARY COOPERATIVE EXTENSION WORK
(Supplementary Smith-Lever appropriation)

Appropriation Act, 1938.....	$790,000
Budget Estimate, 1939.....	395,000
Decrease.....	395,000

PROJECT STATEMENT

Project	1937 (Estimated)	1938 (Estimated)	1939 (Estimated)	Decrease
Payments to States and Hawaii for cooperative agricultural extension work (Supplementary cooperative extension work)...	$1,185,000	$790,000	$395,000	-$395,000(1)

DECREASE

(1) The reduction of $395,000 in this item for 1939 represents a decrease in direct payments to States and Hawaii for cooperative agricultural extension work. A reduction of 25 percent below the appropriation for 1936 was made in each of the fiscal years 1937 and 1938, and the estimate contemplates a further similar reduction for 1939.

WORK UNDER THIS APPROPRIATION

These funds supplement the permanent annual appropriation provided under the Smith-Lever Act of May 8, 1914 (7 U.S.C. 341-348). Like the Smith-Lever funds, they are paid directly to the State colleges of agriculture as Federal aid for the promotion of extension work in agriculture and home economics. This appropriation is divided among the States and Hawaii on the basis of rural population and the funds must be met dollar for dollar. The item contains a provision that not more than $300,000 may be expended for purposes other than salaries of extension agents in counties. As $300,000 is approximately 76 percent of the total appropriation, this means that at least 24 percent of the funds will be expended for salaries of county extension agents if this provision is continued as heretofore.

The State allotments are paid directly to a designated officer in the State and are disbursed in accordance with budgets and programs of work submitted by the State directors of extension and approved by the Secretary of Agriculture. Expenditures by the States from this and other cooperative extension appropriations are subject to an annual inspection by representatives of the Department.

(b) CAPPER-KETCHAM EXTENSION WORK

Appropriation Act, 1938.....$1,480,000
Budget Estimate, 1939..... 1,480,000

PROJECT STATEMENT

Project	1937	1938 (Estimated)	1939 (Estimated)
Payments to States and Hawaii for further development of cooperative agricultural extension work (Capper-Ketcham extension work).....	$1,480,000	$1,480,000	$1,480,000

WORK UNDER THIS APPROPRIATION

This appropriation is specifically authorized by the provisions of the Capper-Ketcham Act of May 22, 1928 (7 U.S.C. 343a, 343b), which authorizes an appropriation of $980,000 to be divided at the rate of $20,000 to each State and to Hawaii, without requirement for State and Territorial offset; and an additional $500,000 to be divided among the States and Hawaii on the basis of rural population, the allotments from this additional $500,000 to be met dollar for dollar by the States or Territory before the money becomes available. The Act further provides that at least 80 percent of the funds appropriated under this authorization shall be expended for salaries of county extension agents and that the extension agents appointed under its provisions shall be men and women in fair and just proportions.

The State allotments are paid directly to a designated officer in the State and are disbursed in accordance with budgets and programs of work submitted by the State directors of extension and approved by the Secretary of Agriculture. Expenditures by the States from this and other cooperative extension appropriations are subject to an annual inspection by representatives of the Department.

(c) EXTENSION WORK, SECTION 21, BANKHEAD-JONES ACT

Appropriation Act, 1938.....$10,000,000
Budget Estimate, 1939..... 11,000,000
Increase..... 1,000,000

PROJECT STATEMENT

Project	1937	1938 (Estimated)	1939 (Estimated)	Increase
Payments to States and Hawaii for cooperative agricultural extension work (Extension work, section 21, Bankhead-Jones Act).....	$8,860,000	$10,000,000	$11,000,000	+$1,000,000(1)
Unobligated balance.....	140,000	- - -	- - -	- - -
Total appropriation.....	9,000,000	10,000,000	11,000,000	+1,000,000(1)

INCREASE

(1) The increase of $1,000,000 in this item for 1939 is to carry out the provisions under Section 21 of the Bankhead-Jones Act, approved June 29, 1935. This Act authorizes the payment of $8,000,000 to the land-grant colleges during the fiscal year 1936 for cooperative agricultural extension, with annual increments of $1,000,000 thereafter for each of the following four years until the total reaches $12,000,000 in the fiscal year 1940, continuing thereafter in that amount. It is available to the States only after they have met the required State offset to Smith-Lever and Capper-Ketcham Acts and supplementary Smith-Lever appropriations. No State offset is required for any of the funds under this Act.

Additional personnel and other expenses are needed in the various States and Hawaii for the expansion of extension work, in order that extension work may be available to all rural people and to enable the cooperative extension service in the States to carry the greatly increased burden of work resulting from the assistance requested of the Extension Service by the Federal agencies created in recent years.

WORK UNDER THIS APPROPRIATION

This appropriation is specifically authorized by the provisions of Title II, Section 21, of the Bankhead-Jones Act of June 29, 1935 (7 U.S.C., Supp. II, 343c), and augments the cooperative agricultural extension funds provided by the Smith-Lever Act of 1914, the Capper-Ketcham Act of May 22, 1928, and supplementary extension appropriations by $8,000,000 for the fiscal year 1936, increased to $9,000,000 for 1937, and $10,000,000 for 1938, with increases of $1,000,000 a year authorized for each of the succeeding two years, making $12,000,000 the final total amount to be appropriated to the land-grant colleges for cooperative agricultural extension work under this Act in the fiscal year 1940, with a like amount for each fiscal year thereafter. While no State offset is required for the funds under this Act, these funds are available to the States only after they have met the required State offset to funds provided under the permanent Smith-Lever Act, the Capper-Ketcham Act, and supplementary cooperative extension work appropriations.

Under the Bankhead-Jones Act, $20,000 is allotted to each State and to Hawaii. The remainder of the fund is then allotted to each State and Hawaii on the basis of farm population. This fund enables the Extension Service to assist other Federal agencies with educational work in agriculture and home economics, agricultural economics, and 4-H club work, as well as other phases of extension.

The State allotments are paid directly to a designated officer in the State and are disbursed in accordance with budgets and programs of work submitted by the State directors of extension and approved by the Secretary of Agriculture. Expenditures by the States from this and other cooperative extension appropriations are subject to an annual inspection by representatives of the Department.

(d) ALASKA

Appropriation Act, 1938....	$18,918
Budget Estimate, 1939.....	21,418
Increase.....	2,500

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Increase
1. Extension of the Smith-Lever Act to Alaska (Act of Feb. 23, 1929).....	$13,918	$13,918	$13,918	- - -
2. Extension of the Capper-Ketcham Act to Alaska (Act of June 20, 1936).....	- - -	5,000	7,500	$2,500(1)
Total appropriation.....	13,918	18,918	21,418	2,500(1)

INCREASE

(1) The increase of $2,500 in this item for 1939 is to carry out the provisions of the Act approved June 20, 1936, authorizing the extension of the Capper-Ketcham Act to Alaska. The extension of the Capper-Ketcham Act is specifically authorized by the Act approved June 20, 1936 (7 U.S.C., Supp. II, 343e). The amount authorized for Alaska was $2,500 for the fiscal year 1937, but this amount was not appropriated due to adjournment of Congress. The amount authorized and appropriated for the fiscal year 1938 is $5,000, with annual increments of $2,500 thereafter until the total reaches $10,000, continuing thereafter in that amount.

The appropriation made available for the fiscal year 1938 will make possible a greatly needed expansion of the small force now at work in the Territory. Through cooperation with the Matanuska Land Settlement Colony, two local agents have been working with headquarters at Palmer, particularly with the families on that project, and this allotment makes it possible to take over these employees on a full-time basis and extend their work to other localities not now served. There has been for some time much need of a District extension agent for southeastern Alaska with headquarters at Juneau. The present budget, even with the increase of Territorial funds for the fiscal year 1938, is not sufficient to provide for this on a full-year basis. With the increase of $2,500 authorized and requested it will be possible to employ a full-time person for much needed work in home demonstration and boys' and girls' club work for this part of the Territory which is not now served.

WORK UNDER THIS APPROPRIATION

General. -- Extension work in agriculture and home economics in Alaska is of a similar nature to that conducted in the States, modifications being made to suit local conditions. In agriculture it includes gardening, some dairying, fur production, and marketing. In home economics there is a wide field for home improvement, due to somewhat pioneer conditions of many Alaskan homes. The 4-H Club work with boys and girls is stressed along the lines of both agriculture and home economics. These Federal funds are paid directly to a designated officer in the Territory and are disbursed in accordance with budgets and plans of work submitted by the director of extension and approved by the Secretary of Agriculture. Expenditures are subject to inspection by representatives of the Department. The provisions of the Smith-Lever Act of 1914 and the Capper-Ketcham Act of 1928 were extended to Alaska by special Acts of Congress, as follows:

1. Extension of the Smith-Lever Act to Alaska (Act of Feb. 23, 1929). -- The extension of the Smith-Lever Act to Alaska is specifically authorized by the Act approved February 23, 1929 (7 U.S.C. 386c). Under the provisions of this Act, $10,000 is appropriated annually to Alaska without requirement of Territorial offset and the remainder ($3,918) must be matched by Territorial funds used for extension work. Experiment stations have been maintained in Alaska for many years, but cooperative agricultural extension work was not systematically begun among farmers until 1931.

2. Extension of the Capper-Ketcham Act to Alaska (Act of June 20,1936).-- Funds provided under the Act of February 23, 1929, were supplemented by the extension of the Capper-Ketcham Act to Alaska as specifically authorized by an Act approved June 20, 1936 (7 U.S.C., Supp. II, 343e). This Act authorized $2,500 for Alaska for the fiscal year 1937, but this amount was not appropriated due to adjournment of Congress. The amount authorized and appropriated for the fiscal year 1938 is $5,000, to be increased on recommendation of the Secretary of Agriculture by $2,500 annually until a total of $10,000 is reached. The Act also provides that the several established judicial divisions of the Territory of Alaska, as the same shall exist from time to time, shall be considered as counties for the purpose of complying with the provisions of the Act until a subdivision of the Territory of Alaska into counties is effected. No Territorial offset is required for any of the funds under the Act approved June 20, 1936.

(e) PUERTO RICO

Appropriation Act, 1938....	- - -
Budget Estimate, 1939.....	$88,000
Increase.....	88,000

PROJECT STATEMENT

Project	1937	1938 (Estimated)	1939 (Estimated)	Increase
Payments to Puerto Rico for extension of the Bankhead-Jones Act to Puerto Rico(Puerto Rico)	- - -	- - -	$88,000	$88,000(1)

INCREASE

(1) The increase of $88,000 in this item for 1939 is to carry out the provisions of the Act approved August 28, 1937 (50 Stat. 881), authorizing the extension of the benefits of section 21 of the Bankhead-Jones Act to Puerto Rico. This Act authorizes the payment of $88,000 to Puerto Rico for the first fiscal year following enactment, with annual increments of $40,000 thereafter until the total reaches $408,000, continuing thereafter in that amount.

Funds are available at the present time to employ only 32 county agents and 12 home demonstration agents and a small administrative staff of 7 people to reach a farm population of approximately 1,200,000. On this present basis, extension work reaches only a small percentage of the total farm population.

The ultimate needs, as the authorized funds become available, are:

1. Increase the number of both county and home demonstration agents to 76 as rapidly as funds become available.
2. Increase gradually the number of subject-matter specialists from 3, employed at the present time, to approximately 30 to work with men and women and to conduct efficient 4-H club work.
3. Supply at least one clerical worker for joint use of each county and home demonstration agent in the 76 municipalities.
4. With an increase in field workers the central staff will need to be increased and a few clerical workers added.
5. The Puerto Rica extension service is in great need of bulletins, film strips, 4-H club materials, etc. All such written matter to be used in Puerto Rico must be printed in Spanish.

The appropriation of $88,000 authorized herein and requested for 1939 would enable Puerto Rico to make an excellent start on the program outlined.

WORK UNDER THIS APPROPRIATION

The Act approved August 28, 1937 (50 Stat. 881), authorizes the extension of section 21 of the Bankhead-Jones Act of 1935 to Puerto Rico, with the provision that the amounts to be paid to Puerto Rico are authorized without diminution of the amounts authorized for payment to the States and the Territory of Hawaii in section 21 of the original Act. This Act also authorizes the payment of $88,000 to Puerto Rico for the first fiscal year following enactment, with annual increments of $40,000 thereafter until the total reaches $408,000, continuing thereafter in that amount. These funds, if made available, will augment the cooperative agricultural extension funds provided under the permanent Smith-Lever Act approved May 8, 1914 (7 U.S.C. 341-348), which Act was amended by the Act of March 4, 1931 (7 U.S.C. 386d-386f), to extend its benefits to Puerto Rico. The funds are available to Puerto Rico only after it has met the required offset to funds provided under the permanent Smith-Lever Act.

This fund will enable Puerto Rico to increase the extension staff to more adequately reach the large rural population of the island in need of help. The Extension Service of Puerto Rico is responsible for bringing to all rural people of the island the latest information regarding agriculture and home economics and to help them adopt improved methods and practices in the production and marketing of crops and livestock; the growing of gardens and other home food supplies; the preservation of food; adequate diets for health; improved sanitation; the development of community life; and other activities to promote higher standards of living. Likewise, the Extension Service has the responsibility for extending training and benefits provided through 4-H club work. No Territorial offset is required for any of the funds under the Act approved August 28, 1937.

The Territorial allotments are paid directly to a designated officer and are disbursed in accordance with budgets and programs of work submitted by the director of extension of Puerto Rico and approved by the Secretary of Agriculture. Expenditures by Puerto Rico from this and other cooperative extension appropriations are subject to annual inspection by representatives of the Department.

(f) ADDITIONAL COOPERATIVE EXTENSION WORK

Appropriation Act, 1938.....	$500,000
Budget Estimate, 1939.....	250,000
Decrease.....	250,000

PROJECT STATEMENT

Project	1937	1938 (Estimated)	1939 (Estimated)	Decrease
Payments to States and Hawaii for additional cooperative extension work (Additional cooperative extension work)	$750,000	$500,000	$250,000	-$250,000(1)

DECREASE

(1) The reduction of $250,000 in this item for 1939 represents a decrease in direct payments to States and Hawaii for additional cooperative extension work. A reduction of 25 percent below 1936 was made in each of the fiscal years 1937 and 1938, and this estimate contemplates a further similar reduction for 1939.

WORK UNDER THIS APPROPRIATION

These funds supplement the permanent specific appropriation provided under the Smith-Lever Act, approved May 8, 1914 (7 U.S.C. 341-348), as well as those provided under the Capper-Ketcham Act, approved May 22, 1928 (7 U.S.C. 343a, 343b). The appropriation provides for additional cooperative extension

work, including the employment of specialists in economics and marketing. These funds are to be allotted by the Secretary of Agriculture to the several States and the Territory of Hawaii in such amounts as he may deem necessary to accomplish such purposes. These funds are also paid directly to the State colleges of agriculture as Federal aid for the promotion of extension work in agriculture and home economics. However, as already indicated, the payments of funds to the States, instead of being based upon rural population, are subject to determination by the Secretary of Agriculture as to the amount that he may deem necessary to accomplish the best results in each State.

The State allotments are paid directly to a designated officer in the State and are disbursed in accordance with budgets and programs of work submitted by the State directors of extension and approved by the Secretary of Agriculture. Expenditures by the States from this and other cooperative extension appropriations are subject to an annual inspection by representatives of the Department.

(g) IN ALL, PAYMENTS TO STATES, ETC.

Changes in Language

Two changes are recommended in the language of the closing paragraph of the appropriation, "Payments to States, Hawaii, Alaska, and Puerto Rico", as follows:

The first changes the summary of the appropriation items to include reference to payments to Puerto Rico.

The second is a correction in the spelling of the word "extension."

EMERGENCY FUNDS

Project	Obligated, 1937
Emergency Relief Appropriation Act, 1935:	
Wind-Erosion Control in Southern Great Plains Area: Balance of allotment authorized by Section 4 of Soil Conservation and Domestic Allotment Act of Feb. 29, 1936 (for apportionment to States in the southern plains area for wind-erosion control).....	$50,000

WORK UNDER THIS ALLOTMENT

Because of the serious situation existing in the southern Great Plains area due to soil blowing and wind erosion, and the great need for emergency measures to check this condition in order to conserve the land, $2,000,000 was

made available to the Secretary of Agriculture by Section 4 of the Act of February 29, 1936, under an allotment provided by the Emergency Relief Appropriation Act of 1935, for allocation and payment to the States in this area for wind-erosion control. Of this amount, $1,950,000 was allocated in the fiscal year 1936 and $50,000 in the fiscal year 1937 to the five States affected -- Colorado, Kansas, Oklahoma, New Mexico, and Texas.

Under plans approved by the Secretary, a State Wind-erosion Control Committee was set up in each State, the chairman of which is responsible for the safekeeping and distribution of funds, and County Wind-Erosion Control Committees were organized in the various counties. Through this machinery, grants were made to individual farmers upon specified terms and conditions for the purpose of listing and otherwise preparing their land to control wind erosion. The unexpended balances in the States were available in these States after June 30, 1937, for continuation of wind-erosion control work as needed.

Direct Appropriations to the Department

(h) GENERAL ADMINISTRATIVE EXPENSES

Appropriation Act, 1938.....$126,246
Budget Estimate, 1939..... 126,246

PROJECT STATEMENT

Project	1937	1938 (Estimated)	1939 (Estimated)
General administration and business service.....	$130,117	$126,246	$126,246
Received by transfer from "Salaries, Office of Secretary".....	- 9,000	- - -	- - -
Unobligated balance.....	5,129	- - -	- - -
Total appropriation.....	126,246	126,246	126,246

WORK UNDER THIS APPROPRIATION

This appropriation provides personnel and funds essential to the proper supervision and general business operations of the Extension Service.

(i) FARMERS' COOPERATIVE DEMONSTRATION WORK

Appropriation Act, 1938	$554,670
Budget Estimate, 1939	545,170
Decrease	9,500

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Decrease
1. Technical advice and assistance in subject-matter fields to State extension forces	$319,853	$394,670	$385,170	-$9,500(1)
2. Studies of extension methods and assistance in training courses for State extension forces	55,592	73,000	73,000	- - -
3. Preparation and distribution of visual material and extension literature to Department and State extension forces	68,871	87,000	87,000	- - -
4. Allotments to States for cooperative agricultural extension work	97,694	- - -	- - -	- - -
Unobligated balance	12,660	- - -	- - -	- - -
Total appropriation	554,670	554,670	545,170	- 9,500(1)

DECREASE

(1) The decrease of $9,500 in this item for 1939 under the project "Technical advice and assistance in subject-matter fields to State extension forces" consists of:

(a) A transfer of $2,500 to "Salaries, Office of the Secretary" for use in connection with the establishment in the Office of the Secretary of an Office of Land Use Coordination.

(b) An actual decrease of $7,000 due to reduction in working funds.

WORK UNDER THIS APPROPRIATION

General. -- This item provides funds for the administration of cooperative extension work conducted in the continental United States and the Territories of Alaska, Hawaii, and Puerto Rico, and for the maintenance of the necessary professional and clerical staff in the District of Columbia. The appropriation is, therefore, a very necessary and vital part of the cooperative agricultural extension system.

1. Technical advice and assistance in subject-matter fields to State extension forces. -- This project covers the cost of maintenance of four regional administration sections (North Central, Northeastern, Southern, and Western), a section of subject-matter specialists, and a section of agricultural economists. The staff of the regional sections is essential to the efficient field administration of extension work, the inspection of expenditures under Federal grants in various States, and the coordination of all extension work in the field. The subject-matter specialists and economic extension staff carry to the State extension services the findings of the research bureaus of the Federal Department and assist them to incorporate such facts in their State programs. They carry information of value also, from State to State, along the lines of agriculture and home economics.

2. Studies of extension methods and assistance in training courses for State extension forces. -- The work under this project is very essential as the Extension Service originates, plans, and conducts, in cooperation with other sections of the Federal extension service and the various State extension services, field and office studies aimed at the development of a scientific body of information which will aid in the further development of agricultural extension, home economics extension, and boys' and girls' 4-H Club work and increase the efficiency of extension workers engaged in these lines of work; promotes and assists the development of more adequate professional training of extension workers -- both for those planning to enter the work and for those already in the service; records and measures the accomplishments of the cooperative extension system; and analyzes and interprets the results obtained in terms of teaching activities and educational progress.

3. Preparation and distribution of visual material and extension literature to Department and State extension forces. -- Under this project the Extension Service maintains such activities as its photographic library, editorial unit, preparation of radio programs, writers for the preparation of special educational material, lantern slides and film strips, and similar informational functions. Service in connection with information and illustrative material is rendered to the approximately 8,500 extension field workers. All annual reports and similar data are prepared under this project.

4. Allotments to States for cooperative agricultural extension work. -- Under this project funds heretofore have been made available to the various States, Hawaii, and Puerto Rico to supplement State and Federal funds available for salaries of field extension workers. These allotments were discontinued beginning with 1938, due to the imperative need for funds in projects 1, 2 and 3, - of vital importance to the efficient administration and servicing of field activities under the increased funds provided by the Bankhead-Jones and other Acts for direct payments to the States and Territories.

A. A. A. FUNDS

Projects	Obligations, 1937	Estimated obligations, 1938	Estimated obligations, 1939
Agricultural Adjustment Administration:			
1. Salaries and Expenses:			
For the services of an extension economist (Washington Office) to assist in the formulating of marketing agreements and in the educational and administrative work in connection therewith in the field as related to the programs of the A.A.A.	$6,600	$8,500	$8,500
Clerical assistance in connection with certain informational activities as related to the programs of the A.A.A.	5,040	- - -	- - -
Total, Salaries and Expenses, A.A.A.	11,640	8,500	8,500
2. Payments for Agricultural Adjustment:			
For salaries and miscellaneous expenses incident to the administration of the extension phases of activities surrounding the completion of A.A.A. commodity programs in Washington and the field	232,525	145,000	- - -
3. Exportation and Domestic Consumption of Agricultural Commodities (Cotton Price Adjustment):			
For special assistance to State extension services in connection with the details of administration incident to receiving and approving applications from cotton producers for participation in the adjustment price payment on cotton and for the employment, supervision, and certification of service of the field personnel required, the rental of office space, telephone and telegraph charges, and freight and express charges in connection with the adjustment price payment on cotton	528,444	95,000	-

A. A. A. FUNDS - Continued

Projects	Obligations, 1937	Estimated obligations, 1938	Estimated obligations, 1939
Agricultural Adjustment Administration - Continued -			
4. Exportation and Domestic Consumption of Agricultural Commodities (Administrative Expenses, Cotton Program):			
For cooperation with the State extension services in the employment of personnel in each county to act as assistants to county agricultural agents in the handling of details connected with the administration of the Cotton Adjustment Price Program administered by the A.A.A.....	- - -	265,000	265,000
Conservation and Use of Agricultural Land Resources:			
For cooperation with Federal and State extension services in carrying out a program planning project in States and counties in connection with the soil conservation and domestic allotment program.....	$215,500	$125,000	$125,000
For the employment of assistants to county agricultural agents in nine Southern States to cooperate with the State extension services in the payment of salary and/or expenses of State extension employees engaged in handling the details connected with the administration of the agricultural conservation program administered by the Agricultural Adjustment Administration..	1,113,500	848,500	848,500
For payment of salaries and/or expenses incurred by State extension employees engaged in handling details connected with the furtherance of the agricultural conservation programs.....	72,304	- - -	- - -
For personal services, materials, etc., necessary to display an extension exhibit at State College, Pennsylvania, in furtherance of the agricultural conservation program..	- - -	77	77
Total, Conservation and Use of Agricultural Land Resources....	1,401,304	973,577	973,577
Total, (A.A.A.) Allotments.....	2,173,913	1,487,077	1,247,077

(j) MOTION PICTURES

Appropriation Act, 1938.....$79,000
Budget Estimate, 1939.....79,000

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
1. Preparation of motion pictures.....	$57,145	$59,230	$59,230
2. Distribution of motion pictures.....	20,100	19,770	19,770
Unobligated balance.....	1,755	-	-
Total appropriation.....	79,000	79,000	79,000

WORK UNDER THIS APPROPRIATION

General. -- These funds meet the expenses incident to the maintenance of a laboratory for the production of motion pictures as a means of disseminating information on the results of scientific research of the various bureaus of the Department and to teach improved methods and practices in agriculture, forestry, conservation, rural engineering, home economics, and kindred subjects.

1. Preparation of motion pictures. -- Under this project the actual costs of the preparation of motion pictures are provided. In cooperation with the various bureaus of the Department scenarios and other details are worked out. Trained personnel is provided for making the necessary pictures and for recording sound, development, processing, and other steps essential to the preparation of films.

2. Distribution of motion pictures. -- Under this project funds are made available for the actual distribution of the completed films. Necessary personnel is provided in Washington, D.C., to maintain records and to book, ship, and inspect films. Notifications of the release of films are prepared and catalogues and other necessary information furnished. Films are loaned to the 8,500 extension workers on request and to other educational agencies.

(k) AGRICULTURAL EXHIBITS AT FAIRS

Appropriation Act, 1938.....$85,000
Budget Estimate, 1939.....85,000

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
1. Preparation of agricultural exhibits to be shown at fairs.....	$46,098	$43,480	$43,480
2. Exhibition of agricultural exhibits at fairs.....	38,402	41,520	41,520
Unobligated balance.....	500	-	-
Total appropriation.....	85,000	85,000	85,000

CHANGE IN LANGUAGE

The wording of this item has been amended by the elimination of the detailed objective itemization and the substitution therefor of the words "persons and means in the District of Columbia and elsewhere" to make the language conform to the more generally accepted phraseology used elsewhere in the Appropriation Act, and in order to more properly represent the work being done hereunder.

WORK UNDER THIS APPROPRIATION

General. -- This appropriation item affords the means by which the Department provides the public at State and interstate fairs and expositions with agricultural information in exhibit form which has come to be recognized as one of the important teaching methods. It also enables the Department, through the maintenance of a trained staff, to partially coordinate the general exhibits work of its bureaus. The activity is carried on through cooperative agreements with fairs within the United States. The Department furnishes the exhibits and personnel for management and demonstration; and the fairs pay a share of the cost of transporting exhibits, furnish exhibition space free, pay drayage and labor for unloading and reloading cars at exhibition points, common labor for unpacking, installing, dismantling, and repacking the exhibits, and janitor, watchman, electrical, and such other special services as are necessary to accomplish creditable displays. The appropriation is used for projects as follows:

1. Preparation of agricultural exhibits to be shown at fairs. -- The work under this project consists of the planning, preparing, and maintenance of agricultural exhibits, involving (a) analysis of subject matter, by study and consultation with specialists and scientists of the Department, of exhibit proposals; (b) determination of form of presentation, and preparation of exhibit designs and building plans; (c) construction and maintenance of exhibits, involving development of mechanical appliances, electrical devices, art work, modeling, and lettering; and (d) investigations of materials, methods, and principles useful in exhibit work.

2. Exhibition of agricultural exhibits at fairs. -- Work under this project consists of negotiating financial and cooperative agreements with fairs, Government departments and bureaus, railroads, associations, organizations, and other agencies for the movement, installing, display, and demonstration of educational exhibits at about sixty exhibits each year, direction and management of such exhibitions, and the warehousing, shipment, return, and care of a vast number of educational exhibits.

(1) TEXAS CENTENNIAL EXPOSITION

(Transfer to Agriculture, Act of August 12, 1935).

A transfer of $80,000 was made to the Extension Service for participation in the Texas Centennial Exposition held in Dallas, Texas, during the years 1936 and 1937. Of this amount $44,165 was available for obligation for the fiscal year 1937. The amounts, $27,500 and $1,147 were transferred to the Texas Centennial Exposition in 1937 and 1938, respectively, and the balance, $15,518, was obligated in the fiscal year 1937.

This transfer was for the purpose of employing personnel, purchasing materials, and the making of contracts necessary in designing, preparing, assembling, transporting, installing, demonstrating, and arranging for the safekeeping of the Department's exhibits at the Texas Centennial Exposition and their return to the custody of the Department and restoration to such condition as to permit their use at subsequent expositions and fairs.

(m) GREATER TEXAS AND PAN AMERICAN EXPOSITION

(Transfer to Agriculture, Act of April 9, 1937).

A transfer of $12,000 was made to the Extension Service for participation in the Greater Texas and Pan American Exposition held in Dallas, Texas, during the fiscal years 1937 and 1938. Of this amount $770 was obligated during fiscal year 1937, and the balance, $11,230, is available for obligation during the fiscal year 1938.

This transfer was for the purpose of employing personnel, purchasing materials, and the making of contracts necessary in designing, preparing, and assembling educational exhibits portraying activities of the Department of Agriculture, and installing, demonstrating, and maintaining these exhibits at the Greater Texas and Pan American Exposition, Dallas, Texas, and for their return to the custody of the Department and restoration to such condition as will permit their use at subsequent occasions.

(n) GREAT LAKES EXPOSITION

(Transfer to Agriculture, Act of May 15, 1936)
(Continuance of participation in 1937, provided for
by Pub. Res. No. 23, approved April 12, 1937).

A net amount of $16,353 was transferred to the Extension Service for participation in the Great Lakes Exposition, Cleveland, Ohio, during the fiscal years 1936, 1937, and 1938. Of this amount $8,017 was obligated during fiscal year 1937, and the balance, $6,968, is available for obligation during the fiscal year 1938.

This transfer was for the purpose of employing personnel, purchasing materials, and the making of contracts necessary in designing, assembling, transporting, installing, demonstrating, and arranging for the safekeeping of the Department's exhibits at the Great Lakes Exposition and their return to the custody of the Department.

(o) INTERNATIONAL EXPOSITION OF PARIS, FRANCE

(Transfer to Agriculture, 1936-1938, as provided by Public Resolution No. 8-S.J. Res. 70-75th Congress, approved Feb. 25, 1937)

A transfer of $2,000 was made to the Extension Service for the purpose of preparing and assembling an exhibit for the Department of Agriculture in connection with its participation in the International Exposition of Paris, France, in the year 1937. Of this amount $526 was obligated in 1937 and $1,074 in 1938, and the balance, $400, was transferred to International Exposition of Paris, France.

A. A. A. FUNDS

Project	Estimated obligations, 1937
Agricultural Adjustment Administration (Salaries and Expenses): (Allotment of A.A.A. funds as authorized by Public Resolution No. 113, 74th Congress, for live-bird and educational exhibit at the Sixth World's Poultry Congress held in Leipzig, Germany.....	$6,400

(p) COOPERATIVE FARM FORESTRY EXTENSION WORK

Appropriation Act, 1938.....	$56,838
Budget Estimate, 1939.....	200,000
Increase.....	143,162

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Increase
1. Cooperation with States for extension activities in farm forestry (Clarke-McNary Forestry Act of June 7, 1924.....	$56,174	$56,838	$100,000	+$43,162(1)
2. Cooperation with States for extension activities in further development of farm forestry (Cooperative Farm Forestry Act of May 18, 1937).....	-	-	100,000	+100,000(2)
Unobligated balance.....	664	-	-	-
Total appropriation.....	56,838	56,838	200,000	+143,162

INCREASE

The increase of $143,162 in this item for 1939 consists of:

(1) An increase of $43,162 for cooperation with States for extension activities in farm forestry (Clarke-McNary Forestry Act of June 7, 1924), as follows:

(a) An increase of $642 for technical advice and assistance to State extension forces, to take care of additional travel of supervising foresters necessitated by proposed additional cooperation.

(b) An increase of $42,520 for allotments to States for cooperative farm forestry under the Clarke-McNary Act, as follows:

(1) $16,780 for placing cooperation with 33 States and Puerto Rico on a basis of $1,980 per annum each. The maximum appropriation previously made under this item was $74,000 in 1932, which permitted cooperation with the States on the basis of $1,980 per annum to each State then in position to provide offsetting funds. When the expenditure from this appropriation was reduced in 1934, it was necessary to reduce State allotments to amounts ranging from $800 to $1620 each. Provision for the Department to pay approximately one-half of the salaries and travel expense, i.e., $1980, of those State extension foresters now employed will provide means for expansion of forestry extension work through the use of State funds thus released. This expansion would be reflected in cooperation by the States in employment of additional foresters under either the Clarke-McNary or Norris-Doxey Acts.

(2) $25,740 for additional cooperation on a full-time basis at $1,980 per annum in the employment of approximately 13 additional farm foresters. Certain States have indicated that they are now in a position to cooperate in the employment of a forester by providing the offset required under the Clarke-McNary Act and, in addition, certain States now cooperating are in a position to meet the required offset necessary to employ a second forester. Accordingly, it is planned to enter into cooperation in the employment of approximately 13 additional foresters on the full-time basis of $1,980 per annum.

(2) An increase of $100,000 for cooperation with States for extension activities in further development of farm forestry (Cooperative Farm Forestry Act of May 18, 1937). The Cooperative Farm Forestry Act (Norris-Doxey) authorizes an appropriation of $2,500,000 to the Department. Under this Act a coordinate program will be carried out by the Forest Service and the Extension Service. As explained in their estimates, the Forest Service will conduct research and other technical phases of the program beyond the educational phase (including the production, procurement, and distribution of planting stock and work on the Prairie States Forestry Project in the Great Plains area), in cooperation with State forestry agencies. With the funds appropriated to the Extension Service, the educational phases of this forestry work will be conducted in cooperation with the Forest Service and the land-grant colleges, such work to be carried on through employment of regional extension foresters and additional State extension foresters. The increase of $100,000 will be used as follows:

(a) An increase of $11,600 in the allotment for technical advice and assistance in the development of farm forestry to State extension forces for the employment of two regional forestry specialists and their traveling expenses, essential to the coordination of all extension activities in the development of farm forestry in the States.

(b) An increase of $88,400 in allotments to States for the development of farm forestry, for cooperation with States in employment of trained specialists in forestry who will conduct educational work directly with farm owners in cooperation with county agents and other cooperatively employed personnel. The management of farm forests for successive timber crops, the need for trees to aid in preventing wind erosion, and the gullying of agricultural soils represent a few of the serious economic problems about which farmers are greatly concerned. The exact number of additional foresters to be employed will depend largely upon negotiations with the various States and the allocation of funds under the Clarke-McNary Act, in order that each State may be equitably treated. While the Norris-Doxey Act does not stipulate that funds allotted to the various States must be offset as in the case of the Clarke-McNary Act, it is expected that many States will be able to make a reasonable contribution in the employment of extension foresters. In those States where funds are thus contributed, it is planned to employ extension foresters on approximately the same basis as under the Clarke-McNary Act, i.e., $1,980 per annum, although the extent of cooperation by the Department will be governed largely by the amount of funds which each State is able to contribute. Thus in some States the cooperation may be on a basis of $1,980 per annum while in others the annual rate of payment by the Department may be somewhat higher. It is probable also that some traveling expenses of State extension foresters will be paid from this fund.

CHANGES IN LANGUAGE

The Budget estimates contemplate changing the language of this paragraph by the addition of appropriate language to provide for Extension Service work incident to carrying out the provisions of the Cooperative Farm Forestry Act (50 Stat. 188), approved May 18, 1937. The title of the item is changed so as to distinguish this item from an item contained in the estimates for the Forest Service under the same enabling Act.

WORK UNDER THIS APPROPRIATION

General. -- Section 5 of the Clarke-McNary Act of June 7, 1924, authorizes an annual appropriation of $100,000 for the promotion of educational work with farm people in establishing, improving, and renewing woodlots, shelterbelts, windbreaks, and other valuable forest growth, and in growing and renewing useful timber crops. Part of this appropriation may be used in Washington for administration and the remainder is allotted to the States and Territories in such amounts as the Secretary of Agriculture may determine upon or as may be agreed upon with the States, provided the States expend an equal amount for a like purpose.

The Cooperative Farm Forestry Act (Norris-Doxey) approved May 18, 1937, authorizes an appropriation of $2,500,000 to the Department. Under this Act a coordinate program will be carried out by the Forest Service and the Extension Service. As explained in their estimates, the Forest Service will conduct research and other technical phases of the program beyond the educational phase (including the production, procurement, and distribution of planting stock and work on the Prairie States Forestry Project in the Great Plains area), in cooperation with State forestry agencies. With the funds appropriated to the Extension Service, the educational phases of this forestry work will be conducted in cooperation with the Forest Service and the land-grant colleges, such work to be carried on through employment of regional extension foresters and additional State extension foresters.

The work of the Extension Service is conducted under the following projects:

1. Cooperation with States for extension activities in farm forestry (Clarke-McNary Forestry Act of June 7, 1924).--The aim of this project is to give technical advice and assistance in farm forestry to State extension forces and to make allotments to States for cooperative farm forestry in order to help the farmer increase his income from his forest land; to provide shelterbelts, windbreaks, etc., for the homestead, and to promote better forestry cultural and marketing practices. The plan to accomplish this is as follows:

The allotment for "Technical advice and assistance in farm forestry to State extension forces" covers the cost of the employment of one extension forestry specialist in Washington, as part of this appropriation may be used and is needed for administration in Washington. His services are essential to the coordination of all extension activities in farm forestry in the field. The extension forester assists the State extension services to incorporate the practical results of the research findings of the Federal Department in their State extension forestry programs and acts as a carrier of forestry extension information from State to State. This specialist also prepares forestry extension literature, makes talks and radio addresses, and otherwise promotes better forestry practices.

The funds for "Allotments to States for cooperative farm forestry" cover the cost of cooperation with the States in the employment of extension foresters. The usual arrangement is for the Federal Government to contribute toward the salary of the extension forester, the State providing for the remainder of his salary, State travel expenses, clerical help, and other necessary expenses. Usually the State contribution is considerably more than that of the Federal Government. At present this cooperative arrangement is in effect with 33 States and Puerto Rico. A very large part of the farm acreage of the United States is in wood land and much of the income of farmers in certain sections, particularly the Northeastern and Southern States, is from forest products. County agents generally are not trained in forest management and need the assistance of farm forestry specialists in strengthening their work in this field. The extension forester arranges demonstrations in woodlot management, selection of trees for cutting, estimating for merchantable timber, and in other fields. In many States the extension forester is also active in assisting farmers in forest planting plans and in interesting members of boys' and girls' clubs in tree planting.

The allotments to the States and Puerto Rico under the Clarke-McNary Act for the fiscal year 1938 are as follows:

Alabama	$1620	Nebraska	$1620
California	1620	New Hampshire	1620
Colorado	900	New Jersey	1620
Connecticut	1020	New York	1620
Georgia	1620	North Carolina	1620
Idaho	1620	North Dakota	1260
Illinois	1620	Ohio	1440
Indiana	1620	Pennsylvania	1260
Iowa	1620	Tennessee	1620
Kansas	1020	Texas	1620
Louisiana	1620	Utah	1080
Maryland	1620	Vermont	1620
Massachusetts	1620	Virginia	1620
Michigan	1620	West Virginia	1620
Minnesota	1620	Wisconsin	1620
Mississippi	1620	Wyoming	1260
Montana	800	Puerto Rico	1620
		Total allotments	50,540

2. Cooperation with States for extension activities in further development of farm forestry (Cooperative Farm Forestry Act of May 18, 1937).--The aim of this project is to further develop farm forestry by carrying out the Extension Service work incident to the provisions of the Cooperative Farm Forestry Act of May 18, 1937. The plan to accomplish this is to give technical advice and assistance in the development of farm forestry to State extension forces and to make allotments to States for the development of farm forestry, as follows:

The allotment for "Technical advice and assistance in the development of farm forestry to State extension forces" covers the cost of employment of two regional forestry specialists. Their services will be essential to the coordination of all extension activities in the development of farm forestry in the States. They will cooperate with the Federal Forest Service and will be responsible to that service for all phases of forestry subject-matter which they will carry to the States in their respective regions, and to the Federal Extension Service for their contacts with extension forces in the field. The regional extension foresters will assist State extension services in their respective regions to incorporate the practical results of the research findings of the Federal Department in their State extension forestry programs and will supervise the work to be conducted by State extension foresters.

The project "Allotments to States for the development of farm forestry" will provide funds to be used for cooperation with States in the employment of trained specialists in forestry who will conduct educational work directly with farm owners in cooperation with county agents and other cooperatively employed personnel. Through this cooperative program, forest conservation on the six million farms in the United States can be integrated with the agricultural programs and supervised so as to contribute definitely to increased farm income.

(q) COOPERATIVE AGRICULTURAL EXTENSION WORK

(Permanent Annual Smith-Lever Appropriation)

Permanent Appropriation, 1938.....$4,701,165
Budget Estimate, 1939..... 4,701,165

PROJECT STATEMENT

Project	1937	1938 (Estimated)	1939 (Estimated)
Payments to States, Hawaii, and Puerto Rico for cooperative agricultural extension work (Smith-Lever Act).....	$4,692,096	$4,701,165	$4,701,165
Unobligated balance.....	4,000	- - -	- - -
Total appropriation.....	4,696,096	4,701,165	4,701,165

WORK UNDER THIS APPROPRIATION

This is the permanent specific appropriation for cooperative agricultural extension work provided in the Smith-Lever Act, approved May 8, 1914 (7 U.S.C. 341-348), as amended by the extension of this Act to the Territory of Hawaii by the Act of May 16, 1928 (7 U.S.C. 386-386b) and to Puerto Rico by the Act of March 4, 1931 (7 U.S.C. 386d-386f).

Under the provisions of these Acts, $10,000 is appropriated annually to each State, Hawaii, and Puerto Rico without requirements of State or Territorial offset, the remainder of the appropriation being distributed on the basis of rural population. This is the basic act under which cooperative extension work is conducted by the Department and the State colleges of agriculture, making available to rural people information on agriculture and home economics. County agricultural agents, home demonstration agents, club workers, and State specialists assist adults and young people in the application of the results of research in agriculture and home economics to meet local conditions and to improve individual farm and home enterprises and rural life generally.

The State allotments are paid directly to a designated officer in the State and are disbursed in accordance with budgets and programs of work submitted by the State directors of extension and approved by the Secretary of Agriculture. Expenditures by the States from this and other cooperative extension appropriations are subject to annual inspection by representatives of the Department.

A. A. A. AND EMERGENCY FUND ALLOTMENTS

(Complete bureau statement)

Projects	Obligated, 1937	Estimated obligations, 1938	Estimated obligations, 1939
Agricultural Adjustment Administration:			
Salaries and Expenses:			
Technical assistance by Extension Service (Washington Office) on agricultural adjustment programs..	$11,640	$8,500	$8,500
For participation in the Sixth World's Poultry Congress (Public Resolution No. 113, 74th Congress)	6,400	- - -	- - -
Payments for Agricultural Adjustment:			
For assistance to State extension forces in completion of commodity programs.....	232,525	145,000	- - -
Exportation and Domestic Consumption of Agricultural Commodities (Cotton Price Adjustment):			
For special assistance to State extension forces in administering the cotton price adjustment plan..	528,444	95,000	- - -
Exportation and Domestic Consumption of Agricultural Commodities (Administrative Expenses, Cotton Program):			
For special assistance to State extension forces in administering the cotton adjustment price program	-	265,000	265,000
Conservation and Use of Agricultural Land Resources:			
For the employment of assistants in nine Southern States engaged in handling the details connected with the agricultural conservation program.....	1,185,804	848,577	848,577
For special assistance to State extension forces on program planning projects incident to the agricultural conservation program.....	215,500	125,000	125,000
Total, Conservation and Use of Agricultural Land Resources	1,401,304	973,577	973,577

A. A. A. AND EMERGENCY FUND ALLOTMENTS, CONT'D.

Projects	Obligated, 1937	Estimated obligations, 1938	Estimated obligations, 1939
Emergency Relief Appropriation Act of 1935: Wind-erosion control in southern Great Plains area: Balance of allotment authorized by Section 4 of Soil Conservation and Domestic Allotment Act of Feb. 29, 1936 (for apportionment to States for wind-erosion control).....	$50,000	- - -	- - -
Total, A.A.A. and Emergency Funds....	2,230,313	1,487,077	1,247,077

WEATHER BUREAU

(a) SALARIES AND EXPENSES

Changes in Language

The estimates contemplate that the language of the preamble paragraph be amended to read as follows:

For the employment of persons and means required for carrying into effect in the District of Columbia and elsewhere in the United States, in the West Indies, in the Panama Canal, the Caribbean Sea, and on adjacent coasts, in the Hawaiian Islands, in Bermuda, and in Alaska the provisions of an Act approved October 1, 1890 /(U.S.C., title 15, secs. 311-313, 317)/, (15 U.S.C. 311-313, 317) so far as they relate to the weather service transferred thereby to the Department of Agriculture, and the amendment thereof contained in section 5 (e) of the Air Commerce Act of 1926 /(U.S.C., title 15, sec. 313)/, (15 U.S.C. 313) /for the employment of professors of meteorology, district forecasters, local forecasters, meteorologists, section directors, observers, apprentices, operators, skilled mechanics, instrument makers, foremen, assistant foremen, proofreaders, compositors, pressmen, lithographers, folders and feeders, repair men, station agents, messengers, messenger boys, laborers, special observers, display men, and other necessary employees; for fuel, gas, electricity, freight and express charges, furniture, stationery, ice, dry goods, twine, mats, oil, paints, glass, lumber, hardware, and washing towels; for advertising; for purchase, subsistence, and care of horses and vehicles, the purchase and repair of harness, for official purposes only; for instruments, shelters, apparatus, storm-warning towers and repairs thereto; for rent of offices/; for repair, alterations, and improvements to existing buildings and care and preservation of grounds, including the construction of necessary outbuildings and sidewalks on public streets, abutting Weather Bureau grounds; /and/ for the erection of temporary buildings for living quarters of observers; /for official traveling expenses;/ for telephone rentals, and for telegraphing, telephoning, and cabling reports and messages, rates to be fixed by the Secretary of Agriculture by agreement with the companies performing the service; /for the maintenance and repair of Weather Bureau telegraph, telephone, and cable lines; and for every other expenditure required/ for the establishment, equipment, and maintenance of meteorological offices and stations and for the issuing of weather forecasts and warnings of storms, cold waves, frosts, and heavy snows, the gaging and measuring of the flow of rivers and the issuing of river forecasts and warnings; for observations and reports relating to crops; and for other necessary observations and reports, including cooperation

with other bureaus of the Government and societies and institutions of learning [for the dissemination of meteorological information], as follows:

The foregoing amendments involve the elimination of much unnecessary detail and the addition of brief wording to cover such elimination, in the interest of securing a simplification and shortening of the text. The authority or scope of the preamble is not affected by these changes.

The only material change is the one at the end of the preamble, providing for the elimination of the words "for the dissemination of meteorological information". This is recommended in order to broaden the authority for cooperation with institutions of learning so as to permit such institutions to perform experiemental or research work in connection with any meteorological or related project proposed or outlined by the Weather Bureau. General authority is now contained in the item "General weather service and research" for collecting and disseminating meteorological, climatological, and marine information, and for investigations in meteorology, climatology, etc., which has been construed to cover projects of a cooperative character pertaining to these subjects. The present language in the preamble relating to cooperation has been construed as appearing to restrict such cooperation to "the dissemination of meteorological information" and might be construed to preclude the prosecution of ether types of cooperative work, including research.

(b) GENERAL ADMINISTRATIVE EXPENSES

Appropriation Act, 1938.	$170,000
Budget Estimate, 1939.	145,000
Decrease.	25,000

PROJECT STATEMENT

Project	1937	1938 (Estimated)	1939 (Estimated)	Decrease
General administration and business service.....	$138,046	$170,000	$145,000	-$25,000(1)
Unobligated balance.....	234	- - -	- - -	- - -
Total appropriation.....	138,280	170,000	145,000	- 25,000

DECREASE

(1) A reduction of $25,000 resulting from the dropping of a non-recurring item (lithographic press), funds for which were provided for the fiscal year 1938.

CHANGE IN LANGUAGE

The clause "and not to exceed $25,000 for the purchase of an offset lithographic press and equipment therefor" has been omitted, since the press will be bought during the fiscal year 1938, and need for this authority will not recur in 1939.

WORK UNDER THIS APPROPRIATION

General administration of the Bureau is centralized in Washington, D.C., and this appropriation provides for the maintenance of fiscal and administrative units, including offices concerned with matters of personnel, accounting, contracts, files, and property.

(c) GENERAL WEATHER SERVICE AND RESEARCH

Appropriation Act, 1938.	$2,342,870
Budget Estimate, 1939.	2,342,870

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
A. Meteorological Service			
1. General forecast and warning service...	$901,101	$952,960	$952,960
2. Climatological service.....	671,879	685,050	685,050
3. Hurricane and stormwarning service.....	96,518	108,500	108,500
4. River and flood service.....	159,507	184,400	184,400
5. Forest fire-weather service.....	61,819	62,300	62,300
6. Agricultural meteorological service....	113,875	114,500	114,500
7. Marine meteorological service.....	104,046	104,500	104,500
8. Horticultural protection service.....	30,382	42,400	42,400
Total, Meteorological service.....	2,139,127	2,254,610	2,254,610
B. Meteorological research			
9. Meteorological physics.....	15,467	15,500	15,500
10. Forecast improvement investigations....	24,918	24,900	24,900
11. Hurricane investigations.....	4,646	4,700	4,700
12. River and flood investigations.....	11,875	11,900	11,900
13. Forest fire-weather investigations.....	3,920	3,930	3,930
14. Agricultural meteorological investigations.....	5,883	5,900	5,900
15. Climatological investigations.....	4,689	4,700	4,700
16. Marine meteorological investigations...	4,702	4,700	4,700
17. Horticultural protection investigations	12,040	12,030	12,030
Total, Meteorological research.....	88,140	88,260	88,260
Total obligations.....	2,227,267	2,342,870	2,342,870
Transferred to "Puerto Rico Reconstruction Administration" (for repairing and repainting Weather Building at San Juan, P.R.).....	1,500	- - -	- - -
Unobligated balance.....	11,888	- - -	- - -
Total appropriation.....	2,240,655	2,342,870	2,342,870

WORK UNDER THIS APPROPRIATION

General.--This appropriation provides for the conduct of all service activities of the Weather Bureau necessary for the maintenance of nationwide meteorological activities serving agriculture, commerce, and many other special interests, as well as the general public. The work consists of the collection and dissemination of meteorological data and the issuance and distribution of weather forecasts, warnings, and advices, as well as the basic research essential thereto. The advisory and warning services, including those in connection with occurrence of storms, hurricanes, cold waves, frosts, fire-weather conditions, and floods, are fundamental purposes set forth in the organic act creating the Weather Bureau.

A. Meteorological Service

1. General Forecast and Warning Service.--The preparation and dissemination of weather forecasts and warnings constitute a fundamental activity of the Bureau, and for this purpose Congress originally authorized a Federal weather service in 1870. Under this project the Bureau is required to take, record, encipher, telegraph, and compile regular meteorological observations; to issue general and local weather forecasts daily, and frost, cold-wave, and other special warnings and forecasts whenever injurious weather and temperature conditions are expected; and to disseminate weather forecasts, warnings, and synopses by telephone and telegraph, by printed bulletins, maps, and forecast cards, and through cooperation with the newspapers, radio broadcasting stations, and other available means, for the benefit of agriculture, commerce, and navigation in all parts of the United States and in adjacent ocean areas. Synoptic weather observations are collected by telegraph, radio, telephone, and telegraph and are immediately charted. Skilled and experienced forecasters who have a thorough knowledge of the physical processes involved are able to determine therefrom the weather changes that will ensue. The forecasts and warnings so prepared are promptly and widely disseminated.

2. Climatological Service.--This service was established by an Act of Congress (15 U.S.C. 311-313, 317), effective July 1, 1891, which charged the Weather Bureau with collecting meteorological data sufficient to establish the climatological characteristics of the United States. The work covers the collection and publication of climatological data for all parts of the United States, including the preparation of maps to show normal climatic conditions in different sections of the country. It involves the maintenance of 5,000 cooperative and other meteorological stations, for which daily, monthly, and annual reports of temperature, precipitation, etc., are compiled and published. There are published 42 separate monthly and annual reports, and data for the entire country are published annually in the United States Meteorological Yearbook. Summarizations are issued in Bulletin W for all past years of record.

3. Hurricane and Storm-Warning Service.--Issuance of storm warnings for the Great Lakes was authorized by Congress in 1870. The service has since been extended to the Atlantic, Pacific, and Gulf coasts, and the use of radio on shipboard has resulted in extension of the service to ships at sea. The Bureau must locate and follow storms, including those of tropical origin (hurricanes) by means of synoptic observations assembled on weather

charts; furnish information as to the location, intensity, and movement of storms; and issue warnings of their approach (including prediction of dangerous winds and tides which sometimes attend them) for the benefit of mariners and residents of seacoast and lakeshore sections. Observations are collected by radio and cable from West Indian stations and from ships at sea to supplement the regular collection for general forecast purposes. Advices and warnings are disseminated by telegraph, telephone, and radio, including displays by means of flags and lanterns at nearly 300 storm-warning display stations located at ports along the coasts of the Atlantic and Pacific Oceans, the Gulf of Mexico, and the Great Lakes. During the hurricane season from June 16 to November 15, inclusive, the Weather Bureau operates a teletype system connecting its offices on the coast of Florida and the Gulf of Mexico by which observations are exchanged between stations and warnings instantly communicated from forecast centers to threatened localities.

4. River and Flood Service.--This service was inaugurated in 1870 with the installation of a few river and rain gages. The organization now consists of 67 river forecasting centers through which approximately 700 river stations, 300 rainfall stations, 84 snowfall stations, and 60 evaporation stations are administered, the whole being under the administrative control of the River and Flood Division. The primary object of the service is the issuance of river stage and flood forecasts for the saving of life and property and for the benefit of agriculture, navigation, and flood control. The service is particularly essential in organizing flood disaster relief and in planning organized evacuation of flooded areas. The flood forecasting service is known to be the means of saving annually millions of dollars worth of property and as planned for the future can be expected to reduce materially the average annual loss which is now approximately $50,000,000. The river stage forecasts made from day to day are of vital importance to navigation interests, to the operation of river control works, and to construction work in progress along rivers. Snowfall depths and density measurements have been made at 84 snowfall stations throughout the country. Fifteen of the snowfall stations have been equipped with batteries of storage snow gages. Evaporation losses have been measured at about 60 evaporation stations throughout the country.

5. Forest Fire-Weather Service.--Fire-weather warnings were first issued in 1916 as a regular service from district forecast centers. In succeeding years several independent fire-weather districts were organized with specialists assigned to the work. Seven separate districts are now maintained. In the conduct of this work meteorological data from fire-weather substations in forested areas are collected and compiled to ascertain the influence of current weather conditions on the frequency and spread of fires. Daily observations obtained by telegraph, telephone, and radio from these substations are utilized in the preparation of special forecasts and warnings, which are issued to Federal, State, and private agencies engaged in the protection of forests from fires. Acting upon the forecasts and warnings, forestry officials augment, deploy, or concentrate their fire-fighting forces in accordance with the indicated weather and hazard conditions. In western districts this program is supplemented by an intensive service designed to aid in controlling individual fires.

Truck units, equipped with two-way radio, meteorological, and compact office facilities are dispatched on call to the scene of large going forest fires, where they become an integral part of the fire-fighting organization. They are essentially portable meteorological offices at which detailed weather reports are collected by radio and from which the forecaster in charge issues timely predictions of vital importance to officers in charge of fire control in formulating suppression tactics.

6. Agricultural Meteorological Service.--In 1872 the Signal Service of the War Department published the first weather bulletin in this country, containining a summary of weather as affecting agriculture. This was finally developed into what are now known as "Corn and Wheat and Cotton Region Bulletins" and "Weekly Weather and Crop Bulletins", which are published at Washington and certain field stations. This project provides for the collection and publication of data relating to current weather conditions and their effect on crop growth and agricultural operations in general. Publication of the data and determination of their effect on crop growth and farm work are based largely on reports from numerous weather observers and weather and crop correspondents in all sections of the United States and on known relations of weather to crops established by investigations and research in the field of agricultural meteorology.

7. Marine Meteorological Service.--Service work on ocean meteorology has been conducted by the Government for almost a century. The Navy and (successively) the Army and the Weather Bureau have maintained individually or cooperatively the continuity of this activity since 1844. The Weather Bureau is now specifically designated by law (5 U.S.C., 458a) to conduct the major lines of work in ocean meteorology and to furnish meteorological information published on the Pilot Charts issued by the Hydrographic Office of the Navy. The primary objects of the project are the maintenance and improvement of ocean weather observations and reports through an extensive program organized for rapidly collecting, charting, and summarizing the reports to provide maritime commerce with accurate, properly digested meteorological information and at the same time to secure data for basic studies of weather conditions and storms affecting the continental United States and the adjacent oceans. Daily weather observations at sea are taken and reported in prescribed form by ships' officers using (in the main) meteorological instruments that are regularly a part of a ship's instrumental equipment. Contacts with the observing officers and supervision of the meteorological instruments are largely accomplished through 30 field offices of the Weather Bureau located at major ports of the United States and its island possessions.

8. Horticultural Protection Service.--With the advent of a systematic practice of protecting orchards and truck gardens from frost, specialized local forecasts, as an aid in protecting operations, became necessary. The special Horticultural Protection Service of the Weather Bureau began in 1917. The work consists of specialized local forecasts for the use of fruit and truck growers in their frost-protection work; also advice as to best methods of protection. The forecasts are made from synoptic weather charts and current local observations, including hydrometric formulae applicable to the particular locality.

B. Meteorological Research

9. Meteorological Physics.--A knowledge of the physical processes that occur in the atmosphere is basic to an efficient meteorological service. Studies along this line have been made in the past with important results, but they are even more necessary and valuable now in view of the more abundant and more accurate data available on land, at sea, and in the air and the increasing use of the knowledge of physical processes in all practical applications of meteorology. The object of the work is to advance our knowledge of physical conditions and processes in the atmosphere that produce weather phenomena, including the distribution and effects of solar radiant energy, and to adapt the results of theoretical investigations to the needs of the practical work of the Bureau. One or more technical problems are under specific investigation at all times. The current literature on technical subjects relating to meteorology is read and digested in order to keep fully informed of every new development. Continual contact is maintained with others conducting scientific research in related fields.

10. Forecast Improvement Investigations.--Studies for the purpose of improving the accuracy and extending the period of weather forecasts have been carried on currently since the establishment of the Weather Bureau. Such studies have resulted in a better understanding of the physical problems involved and in improved service to the public. The work covers investigations of the causes of weather changes in an endeavor to ascertain the physical basis of the changes, including the genesis of fronts and disturbances; the formation of rules and principles for the guidance of the forecaster; and the development of means for extending the period of the forecasts to cover a month or season. Investigations are carried on at the six district forecast centers where the forecasters alternate monthly between active duty and study. Similar researches are conducted at other field stations. Intensive studies of frontal, kinematic, and thermodynamic analyses of surface and upper-air synoptic charts, including isentropic charts and flow patterns, and of air masses, are prosecuted at the central office in Washington. Files of daily weather maps and the meteorological records, both surface and upper-air, of past months, seasons, and years form the basis of statistical and other investigations.

11. Hurricane Investigations.--Investigations of hurricanes by the Weather Bureau date back nearly half a century. Development and utilization of the knowledge of hurricane characteristics and movements was stimulated by the invention and growth of radio communication in the first quarter of the present century. As a result, much additional information is now available as a basis for the investigations. Fully developed hurricanes are attended by winds dangerous to ships at sea and destructive to life and property in coastal sections. Some are accompanied by inundations which cause great loss of life and property. All available observations from ships at sea and island and coastal stations, including detailed reports secured by mail, are charted for study of each hurricane. The studies concern the movement of hurricanes in relation to kind, amount, and movement of clouds; wind directions and speed at the surface and from pilot balloon observations of the upper air; direction, period, and amplitude of sea swells which precede the hurricane; tides along the coast in advance of the storm center; and the general pressure distribution.

12. River and Flood Investigations.--This work consists of studies of the relation of precipitation to both ordinary flow and flood flow in streams. River-stage forecasting procedure is supplemented by hydrologic methods of estimating streamflow from rainfall and other related factors. For this purpose the country has been divided into 9 hydrologic regions. Cooperation is maintained with the Geological Survey and the Commonwealth of Pennsylvania, the purpose of which is to develop an improved forecasting service on the streams of that State. Studies of snow-melt-runoff relationships are being conducted on three experimental watersheds established in Yellowstone Park. Studies of storm rainfall and related hydrologic factors are being conducted in a section of the River and Flood Division for the purpose of providing data essential to the design of spillways and waterways. Evaporation investigations are being conducted cooperatively with the University of Iowa.

13. Forest Fire-Weather Investigations.--Forest fires cause great economic losses, amounting in some years to hundreds of millions of dollars. One of the functions of the Weather Bureau is to assist in lessening this destruction by determining the exact relationships between meteorological conditions and the inception and spread of forest fires. Intensive investigations of this character were instituted in 1924. The studies conducted under this project result in a more adequate conception of the effects of weather conditions upon fire hazard and the variations of temperature, humidity, etc., over areas of varied topography. Such information is essential, and results of statistical and other studies are used to improve the fire-weather warning service. Daily observations are compiled by decades, months, and seasons, and the extremes and averages of conditions are correlated with fire occurrences. Intensive studies of weather conditions in relation to the occurrence of lightning storms with little or no precipitation are carried on because of the large number of fires caused thereby.

14. Agricultural Meteorological Investigations.--For many years there have been more or less systematically conducted investigations of the effect of weather on crops. Results of the first extensive investigations of the Weather Bureau in this field are contained in Weather Bureau Bulletin No. 36, "Relations Between Climates and Crops", by Cleveland Abbe, in 1905. Since then considerable investigational work has been done and the results published. Investigations are made to determine the relation between weather and crops, especially optimum weather conditions for different crops, as an aid, among other things, in determining the areas best suited, from the climatic standpoint, for various crops. Up to the present time the work has been carried on principally through mathematical correlations of temperature, sunshine, precipitation, relative humidity, and other weather elements with crop yields.

15. Climatological Investigations.--When sufficient meteorological records became available, for some stations as early as 1870, investigations were begun to determine the climatic characteristics of different sections of the United States, and work of this character has continued up to the present time, becoming more dependable as the length of the records increased. Also from time to time various climatic charts have been prepared and revised as additional data became available. Studies are made to determine the climatic features of the United States and, incidentally, in a meager way, of foreign countries. Climate is a deter-

mining factor in economic land use, and for best results in agriculture, in general, and for specific use of land for certain crops, it is necessary to have dependable information as to the normal climate and variations therefrom. Summarizing, studying, charting, and comparing weather records of different sections for long periods of time and the preparation of normal charts for different climatic elements showing geographic distribution of comparable conditions are conducted under this project; also special studies, such as climatic trends, drought frequency, etc., for different areas.

16. Marine Meteorological Investigations.--The study of winds and storms at sea constituted one of the earliest phases of meteorological research because of the extreme importance of ocean weather to transport by sail, and this interest on the part of navigators has continued to the present time. Work under this project involves the analysis of data from accumulated records for application to meteorological problems. The importance of such analyses to determine atmospheric conditions over the oceans is accentuated by the development of air navigation. Research in marine meteorology has the following objectives: (1) Continual revision and improvement of the data required by law to be furnished for publications on the Pilot Charts of the Hydrographic Office of the Navy Department for benefit of maritime commerce; (2) extraction of data from the accumulated records for application to modern problems of ocean transport, including air navigation, air-conditioning and refrigerating of ships, and determination of climatic influences on cargoes moving on routes that encounter a wide variety of weather conditions within the term of a single passage; and (3) investigation into the energy relations subsisting between the ocean surface and the overlying atmosphere to obtain data useful for studies of air-mass analyses and for possible application to problems of extension in the range of weather forecasts. Research is being advanced by the development of punch-card methods of statistical analysis; by application of mathematical correlation methods to evaluate the importance of diverse factors of relation between ocean and atmosphere; and by steady increase in properly digested summaries of ocean weather data.

17. Horticultural Protection Investigations.--For specialized local frost forecasting for the protection of fruit and vegetables, basic data applicable to the specific localities were necessary, and investigational work to obtain these began in 1917. Various forecasting formulae, etc., have been improved from time to time as longer records became available. Studies are made to determine the relative susceptibility to frost of different localities having varying topographic features, and meteorological data are collected for the preparation of hygrometric formulae as an aid in local forecasting. Investigations are also conducted as to the most effective and economical methods of protecting fruit and vegetable crops from frost damage. Establishment and maintenance of a large number of meteorological stations representing different topographic and other conditions is required to determine temperature and humidity relations in different localities.

(d) AEROLOGY

Appropriation Act, 1938.	$2,190,179
Budget Estimate, 1939.	2,732,130
Increase.	541,951

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Increase or decrease
A. Aerological Service				
1. Commercial airway meteorological service.....	$1,209,260	$1,791,679	$2,336,630	+$544,951(1)
2. Upper-air soundings.....	352,995	356,000	356,000	- - -
Total, Aerological service	1,562,255	2,147,679	2,692,630	+ 544,951
B. Aerological Research				
3. Commercial airway forecast investigations.....	9,467	9,500	9,500	- - -
4. Upper-air surveys and investigations.....	29,834	30,000	30,000	- - -
Total, Aerological research	39,301	39,500	39,500	- - -
Total obligations.....	1,601,556	2,187,179	2,732,130	+ 544,951
Received by transfer from "Air Navigation Facilities, Department of Commerce".....	- 120,000	- - -	- - -	- - -
Transferred to "Commerce, Bureau of Standards"....	+ 3,000	+ 3,000	- - -	- 3,000(2)
Unobligated balance.....	9,533	- - -	- - -	- - -
Total appropriation.....	1,494,089	2,190,179	2,732,130	541,951

INCREASES OR DECREASES

The net increase of $541,951 in this item for 1939 consists of:

(1) An increase of $544,951 for Commercial Airway Meteorological Service, as follows:

(a) $449,951 for establishment of Weather Bureau airport stations at 33 airway terminals; and for inaugurating hourly weather reporting service at 9 points on airways.

The Secretary of Commerce has requested the establishment of Weather Bureau airport stations at 40 important airway terminals which do not now have Weather Bureau service, in order that weather maps, hourly weather reports, upper-air wind data, and meteorological advice may be available at those points and along radiating airways for the safety of air navigation and for the particular requirements of the Bureau of Air Commerce

airway traffic control program. With the above amount, the Weather Bureau would establish a minimum of 33 stations at airway terminals, manned by full-time Weather Bureau personnel, and a minimum of 9 stations, for hourly weather reporting service on airways, manned by part-time observers under the supervision of a full-time Weather Bureau employee.

(b) $20,000 for establishment of new stations and extension of airway weather service in Alaska.

The Secretary of Commerce has also recommended that the Weather Bureau obtain funds for the extension and strengthening of the airway meteorological service in Alaska, to keep pace with and for the protection of the rapidly expanding air transport and aviation activities. Due to the deficiency of surface transportation, aviation is a major factor in the development of the Territory, and the airway meteorological service should be expanded and intensified to meet this situation. The $20,000 increase will permit the establishment of first-order Weather Bureau stations at Anchorage and Ruby, with facilities for taking upper-air wind observations; the assignment of one additional employee to each of the existing first-order stations at Juneau, Fairbanks, and Nome, thus permitting additional observations and service at those points; and some slight intensification of service at and in the vicinity of other important points.

(c) $75,000 for the procurement, installation, and maintenance of modern instruments for airway stations now having incomplete or outmoded equipment.

The Secretary of Commerce has recommended that the Weather Bureau request funds for replacing outmoded instruments and completing the instrumental equipment at airway stations now deficient in this respect. At present many of the airway weather reporting stations are incompletely equipped with instruments, and at many places the present equipment is partially or almost completely out of date. This results in incomplete and inaccurate reports being received from such points, omissions and inaccuracies usually showing up in the most vital data, such as ceilings, dew points, winds, etc., which must, as a safety factor, be measured carefully by the most improved equipment possible to obtain. Because pilots and others using the airways, as well as the meteorologists of the Weather Bureau, are forced to use observations based on questionable or inadequate data, the efficiency of the service as a whole is greatly weakened.

(2) A reduction of $3,000 made possible through the contemplated completion during the fiscal year 1938 of a type of radiometeorograph by the Bureau of Standards, funds for which were provided during the fiscal years 1937 and 1938.

WORK UNDER THIS APPROPRIATION

General.--As a consequence of the provisions of the Air Commerce Act of 1926, meteorological information and flying-weather forecasts are furnished to pilots on all airways designated by the Secretary of Commerce as routes suitable for air commerce. In addition, investigation and study

and general weather forecasting of the upper air in the interest of air navigation are conducted under this appropriation.

A. Aerological Service

1. Commercial Airway Meteorological Service.--Intensive weather service for air navigation was inaugurated by the Weather Bureau soon after passage of the Air Commerce Act in May, 1926. At the close of 1926 the transcontinental airway was the only one on which flights were being made both day and night. Since that time the airway weather service has expanded with increased number of Federal airways. In 1937 there was approximately 20,000 miles of airways over which 24-hour weather service was maintained and approximately 15,000 miles over which service was maintained on a less than 24-hour basis. The airway weather service is maintained to provide the maximum amount of safety possible in air navigation so far as weather is concerned.

Specific and accurate weather information is essential in air travel, particularly as regards ceiling heights and visibility. The airway weather service consists primarily of hourly reports from stations on the airways and 6-hourly reports from off-airway stations, the latter category being composed of about 160 stations, thus providing a dense network of reports over the country as a whole. These reports are collected at 11 designated centers where they are charted and aviation forecasts prepared. These forecasts are promptly distributed over the airways network, chiefly by means of teletype and radio, with special advices at 3-hourly intervals whenever important weather changes justify.

2. Upper-Air Soundings.--Observations in the upper air were begun in 1898 by the use of kites and captive balloons. Airplane observations began to displace kites and captive balloons in 1931 and wholly supplanted them in 1933.

In July 1934 the Weather Bureau operated 6 airplane observation stations by contracting with commercial flyers, and the War and Navy Departments made airplane observations at approximately an equal number of stations each. Beginning in the first half of the fiscal year 1938, the Weather Bureau will have under contract 13 airplane observation stations, including one at Fairbanks, Alaska. The War and Navy Departments will make observations at 8 and 9 stations, respectively, including the Navy Department's stations at Pearl Harbor, Hawaii; Coco Solo, Canal Zone; and St. Thomas, Virgin Islands. The Dominion of Canada will make airplane observations at Toronto, Canada; and the Government of Newfoundland will make such observations at Norris Arm, Newfoundland. All of these observations will be available for use at forecast centers and other points in the United States.

Pilot-balloon observations were inaugurated by the Weather Bureau in 1918, with the number of stations gradually increasing to some 77 in 1937. Airplane and pilot-balloon observations are essential in both general and airway forecasting and in identifying air masses.

Sounding-balloon observations provide the same data as both airplane and pilot-balloon observations but to much greater heights. The records, however, are not available for current use, as the meteorograph usually lands at a considerable distance from the stations.

Radiometeorograph sounding-balloon observations will be made in 1937 at Burbank, Calif., Fairbanks, Alaska, Washington, Mass., and Washington, D. C. Airplane observations are made daily to heights of 16,500 feet, and free-air temperatures, pressures, and humidities are obtained. Pilot-balloon observations are made 4 times daily, and free-air wind directions and velocities at various elevations are obtained. These data are furnished to local flying interests and promptly transmitted to the various forecast centers. The computed records are forwarded to the central office of the Weather Bureau at Washington, where they are summarized and used in special studies and investigations. Monthly free-air temperatures and relative humidities for each station and monthly free-air wind resultants for a selected number of key stations are published regularly in the "Monthly Weather Review". Sounding-balloon observations are made at only one or a relatively few stations in connection with special investigations of particular weather conditions and during international programs.

B. Aerological Investigations

3. Commercial Airway Forecast Investigations.--With the accumulation of observational data obtained since the inauguration of intensive airway weather service subsequent to the passage of the Air Commerce Act of 1926, studies have been made with a particular view to determining average flying weather conditions along the airways. Such studies are valuable in laying out new airports and airways and for determining regular flight schedules. Investigations under this project are conducted at the central office at Washington, D.C., and at stations where qualified personnel and the necessary data are available.

4. Upper-Air Surveys and Investigations.--Numerous aerological surveys have been made to determine average temperatures, pressures, humidities, densities, winds, etc., at various elevations for different sections of the country, as well as special studies and investigations of upper-air conditions. Upper-air observations are classified and correlated with surface conditions in order to determine significant relationships which may be useful in forecasting or to aid in a better understanding of the mechanics of the atmosphere. All observational data are forwarded to the central office of the Weather Bureau in Washington where they are summarized and classified. The data are then used for making special studies and investigations leading to the improvement of general and airway forecasting, both as regards accuracy and length of time covered; to determine meteorological conditions favorable for the information of ice on aircraft; and to effect improvements in methods of pressure reductions to sea level and to the 5000-foot plane; and to increase our knowledge of the mechanics of the atmosphere.

CHANGES IN LANGUAGE
UNDER PARAGRAPH "TOTAL, WEATHER BUREAU"

It is recommended that the language of this paragraph be amended to include the word hereafter immediately following words "Provided, that".

It is desired to make the existing proviso for reimbursement of part-time employees for job work permanent legislation, so that the bill may be shortened by elimination of this language in 1940. This has been accomplished by the insertion of the word "hereafter".

SUPPLEMENTAL FUNDS

Direct Allotments

Projects	Obligated, 1937
Emergency Relief Appropriation Act of 1935:	
Development of a method of long-range weather forecasting.....	$1,631
Repair or replacement of river gages damaged or destroyed by the floods of 1936.....	5,000
Total, Supplemental Funds (Direct Allotments)....	6,631

BUREAU OF ANIMAL INDUSTRY

(a) SALARIES AND EXPENSES - PREAMBLE

Changes in Language

In the interest of simplicity and uniformity of appropriation wording, the Budget estimates provide that the language "to employ and pay from the appropriation herein made as many persons in the city of Washington or elsewhere as he may deem necessary," be changed to read "to employ persons and means in the city of Washington or elsewhere."

(b) GENERAL ADMINISTRATIVE EXPENSES

Appropriation Act, 1938	$178,220
Budget Estimate, 1939	178,220

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
General administration and business service	$174,273	$178,220	$178,220
Unobligated balance	3,947	----	----
Total	178,220	178,220	178,220

WORK UNDER THIS APPROPRIATION

This appropriation is used for activities concerned with the general direction of the research service and regulatory work of the Bureau, including the expenses of the Chief of Bureau's office, accounting, personnel, property, library, editorial activities, etc.

(c) ANIMAL HUSBANDRY

Appropriation Act, 1938.....$789,380
Budget Estimate, 1939..... 789,380

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
1. Swine husbandry investigations	$117,233	$132,622	$132,622
2. Sheep and goat husbandry investigations	140,291	145,386	145,386
3. Horse and mule husbandry investigations	41,133	41,934	41,934
4. Beef cattle husbandry investigations	161,603	163,361	163,361
5. Dual-purpose cattle husbandry investigations	58,449	61,259	61,259
6. Poultry husbandry investigations ...	223,304	238,957	238,957
7. Certification of pedigrees of imported livestock	4,973	5,861	5,861
Unobligated balance.....	22,517	----	----
Total	769,503	789,380	789,380

CHANGES IN LANGUAGE

The Budget estimates provide for the elimination of the words "all necessary expenses for" and the words "including the employment of labor in the city of Washington and elsewhere, rent outside the District of Columbia, and all other necessary expenses." This is believed to be superfluous language inasmuch as the introductory clause to "Salaries and expenses" contains the necessary authority for the employment of persons and means in the District of Columbia and the field.

WORK UNDER THIS APPROPRIATION

General.--The animal husbandry investigations of the Bureau of Animal Industry deal with the collection and dissemination of information on livestock problems of regional and national importance having to do with the breeding, feeding, and management of domestic farm animals, including poultry. Results are measured in terms of quantity and quality of the animals and their products, such as meat, eggs, wool, mohair, and farm power. These experiments often are conducted in cooperation with other bureaus and divisions of the Department, wi one or a group of State agricultural experiment stations, with farmers, and wit other agencies.

1. Swine Husbandry Investigations.--This work includes studies to identify and develop strains of swine and to develop methods of feeding and management that will make possible the production of pork economically and profitably; and studies on conformation and yields, proportion of meat to bone, composition, tenderness, flavor, juiciness, and other characteristics of pork and pork products as influenced by variations in production factors and in processing and preparation, including slaughtering, chilling, cutting, curing, rendering of lard, storing, canning, and cooking. Swine normally represent about 10 percent of the value of all agricultural production in this country. The results already achieved have been highly valuable, but many problems remain to be worked out and new problems are constantly arising which call for solution.

2. Sheep and Goat Husbandry Investigations.--This work deals with the factors affecting production of lamb meat, wool, goats' milk, and mohair. Studies in the breeding and development of types most suitable for production and studies in the methods of management and feeding are made with sheep and goats and the results tabulated and interpreted for other workers and for the industry. The experimental animals are of known ancestry for many generations back. Data are kept on them from birth to slaughtered carcass, including such factors as productivity, rate of growth, earliness of maturity, and quality of production. Many of the new principles which have resulted from these studies in the past have been utilized by the sheep and wool and mohair industries.

3. Horse and Mule Husbandry Investigations.--This project consists of studies in breeding, feeding, management, cost of production and maintenance, and utilization of horses and mules, including work with both light and draft breeds of horses and physiological studies in the rearing of orphan foals. Information on stallion enrollment in the various States having stallion enrollment laws is compiled and distributed. A nationwide shortage of work stock and increased interest in the breeding of horse and mule replacements create a demand for information looking toward improved breeding stock.

4. Beef Cattle Husbandry Investigations.--This work consists chiefly of research in problems affecting the breeding, feeding, and management of beef cattle and the quality of their meat. It includes studies in range livestock production, in feeding and fattening various classes of beef cattle under both farm and range conditions, beef-cattle record-of-performance studies, breeding studies to develop crossbred cattle which will be especially adaptable to certain sections of the United States having unfavorable climate, and the development of strains within the established beef breeds that will have superior germ plasm for efficiency and quality of production. Pasture management and grazing studies, mineral deficiency problems affecting range cattle production, and special vitamin and other nutritive requirements also are dealt with.

5. Dual-Purpose Cattle Husbandry Investigations.--This work consists chiefly of research in problems relating to breeding. It includes studies in the development of true breeding strains of Milking Shorthorn and Red Polled cattle for high fertility, desirable conformation, and comparatively high production of both beef and milk; studies of the performance of the offspring to determine the relative values of germ plasm of different strains; meat studies to determine the quality of the meat; and studies of the nutritive requirements of dual-purpose cattle for growth and production.

6. Poultry Husbandry Investigations.--The work under this project consis chiefly of research in breeding, feeding, hatchability, and flock management. The breeding studies are conducted for the purpose of enabling producers to develop, through selection and breeding, more efficient egg and meat producing strains to improve the quality of eggs, breeding stock, and poultry meat. Studies in poultry nutrition are carried on in order to develop efficient diets for all classes of poultry and to develop methods for the most efficient utilization of feed in order to promote the most economical production of eggs and poultry meat of superior quality. Other lines of research embrace a study of fundamental principles involved in various physiological practices associated with the production of poultry and poultry products and studies on the most efficient methods of incubation.

Cooperation is had with the States through official State agencies in putting into effect the regulations of the National Poultry Improvement Plan, which are designed to improve the quality of hatching eggs, baby chicks, and breeding stock produced by those participating in the plan. Over 6,000,000 farmers raise poultry, and there are several thousand commercial poultry producers. Over 400,000,000 laying hens are kept in the United States annually and the average egg production is approximately 90, whereas improved methods of feeding and proper selection could readily increase this to 150, and, by further improved methods, to an average of 170. Approximately 800,000,000 chicks are raised in the United States annually, most of them in commercial hatcheries, of which there are approximately 12,000.

7. Certification of Pedigrees of Imported Livestock.--This work is regulatory and consists of the certification of purebred animals imported into the United States under the provisions of paragraph 1606 of the Tariff Act of 1930. It comprises the examination of pedigrees of the animals imported and certification to the Collector of Customs at the port for entry free of duty.

(d) DISEASES OF ANIMALS

Appropriation Act, 1938	$447,775
Budget Estimate, 1939	447,000
Decrease	775

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Decreas
1. Investigations of nonparasitic diseases of livestock:				
(a) Hemorrhagic septicimia investigations	$3,782	$2,175	$2,175	----
(b) Equine encephalomyelitis and forage-poisoning investigations	8,797	9,565	9,565	----
(c) Mammitis investigations	7,732	6,525	6,525	----

PROJECT STATEMENT -- Continued

Projects	1937	1938 (Estimated)	1939 (Estimated)	Decrease
1. Investigations of nonparasitic diseases of livestock -- Continued.				
(d) Anaplasmosis investigations	$6,965	$11,415	$11,415	----
(e) Rabies investigations	3,837	3,815	3,815	----
(f) Anthrax investigations	4,495	6,525	6,525	----
(g) Swine erysipelas investigations	5,615	4,895	4,895	----
(h) Miscellaneous disease investigations	19,885	21,803	21,343	- $460(1)
(i) Contagious-abortion investigations	78,028	78,182	78,182	----
(j) Stock poisoning by plants, investigations of	18,974	20,650	20,650	----
(k) Poultry disease investigations	28,018	29,890	29,890	----
(l) Swamp-fever investigations.	12,906	15,000	15,000	----
(m) Tuberculosis, tuberculin, and reputed immunizing agents, investigations of.	26,557	22,500	22,500	----
(n) Types of tubercle bacilli, investigations of	1,480	3,000	3,000	----
(o) Johne's disease investigations	2,091	3,000	3,000	----
(p) Methods of producing immunization against hog cholera, investigations of	21,980	22,495	22,495	----
(q) Modes of dissemination of hog cholera, investigations of.....	5,369	5,025	5,025	----
(r) Periodic ophthalmia of equines investigations ...	----	10,000	10,000	----
Total, Investigations of nonparasitic diseases of livestock	256,511	276,460	276,000	- 460
2. Investigations of parasitic diseases of livestock:				
(a) Index catalog of medical and veterinary parasitology and maintenance of parasite collection	9,213	8,000	8,000	----
(b) Poultry parasite investigations	16,543	18,000	18,000	----
(c) Swine parasite investigations	19,485	21,000	21,000	----

PROJECT STATEMENT -- Continued

Projects	1937	1938 (Estimated)	1939 (Estimated)	Decrease
2. Investigations of parasitic diseases of livestock -- Continued.				
(d) Parasites causing and transmitting anaplasmosis in cattle	$11,578	$10,450	$10,400	-$50 (1)
(e) Ox-warble investigations ..	29,636	32,000	32,000	----
(f) Liver-fluke investigations .	14,536	20,000	20,000	----
(g) Internal parasites of ruminants, investigations of	21,777	16,800	16,800	----
(h) Horse parasite investigations	6,532	10,800	10,800	----
(i) Miscellaneous parasite investigations, including parasites of dogs, cats, wild animals, etc.	21,936	19,000	19,000	----
(j) Anthelmintics and insecticides for the destruction of parasites, investigations for the development of	10,806	15,265	15,000	-265 (1)
Total, Investigations of parasitic diseases of animals	162,042	171,315	171,000	-315
Unobligated balance	19,222	----	----	----
Total	437,775	447,775	447,000	-775 (1)

DECREASE

(1) The estimates provide for a reduction of $775 in this item for 1939, which is distributed, by projects, as indicated in the above statement.

CHANGES IN LANGUAGE

The Budget estimates provide for two changes in the language of this item as follows:

(1) The elimination of the words "all necessary expenses for". This is believed to be superfluous language inasmuch as the introductory clause to "Salaries and expenses" contains the necessary authority for the employment of persons and means in the District of Columbia and the field.

(2) The language authorizing expenditures for maintenance of the Bureau experiment station at Bethesda, Maryland is omitted as that station is no longer being maintained by the Department.

WORK UNDER THIS APPROPRIATION

General.--Items under this appropriation include research investigations into the cause, prevention, and treatment of the infectious, noninfectious, and parasitic diseases of livestock, including poultry, and stock poisoning by plants. These investigations include both field and laboratory studies and have for their object the development of the necessary information that will lead to the formulation of methods for the control and eradication of the various diseases that are the cause of heavy loss to the livestock industry of this country. Complete information as to the cause and mode of transmission of diseases is necessary before the most effective measures can be taken for their control. Research in the past has made it possible to formulate and put into effect practical measures for the control and in some cases the eradication of diseases of high economic importance, resulting in great benefit to the livestock industry. Complete information, however, on many important diseases is still lacking, so that effective measures for the reduction of losses occasioned by them must await further research.

1. Investigations of Nonparasitic Diseases of Livestock.--This project consists of research into methods of diagnosis, cause, mode of transmission, and methods of prevention, treatment, and control of the more important infectious and noninfectious diseases of livestock, including poultry. Work is conducted along the lines indicated in the projects listed below:

(a) Hemorrhagic Septicemia Investigations.--Previous investigations of hemorrhagic septicemia resulted in the development and improvement of biologics for the immunization of animals against this disease, which has been responsible for losses in livestock estimated at upwards of a million dollars annually. Although these biologics have been effective in controlling the disease as it occurs in acclimated animals on the home premises, no satisfactory utilization of them has yet been found to safeguard the millions of feeder and stocker cattle that become exposed to the shipping-fever form of the disease while in transit from their home ranches and farms to other sections of the country where they are to be fattened. Investigations at this time are directed toward evaluation of systematic alkalinization as a means of controlling the shipping-fever form of the disease.

(b) Equine Encephalomyelitis and Forage-Poisoning Investigations.--Losses in horses in various parts of the country have occurred for many years which until a few years ago had been generally considered to be due to spoiled forage (forage poisoning). Particularly severe losses have occurred in certain years. In 1930 it was shown that a severe epizootic in horses in California was due to an infectious agent, a filterable virus, producing an inflammation of the brain and spinal cord (encephalomyelitis). The specific virus disease has been definitely identified by laboratory means in 22 States and has been diagnosed clinically in 10 other States. Further work is under way to determine positively the existence of the virus disease in the latter States. Additional information is being sought on the modes of transmission, including an explanation of the manner in which the infection is carried over from one epizootic to another, and on improved methods

of diagnosis and means of immunizing horses against the disease. Recent outbreaks of a somewhat similar disease following in the wake of the virus infection are being investigated.

(c) Mammitis Investigations.--Mammitis, mastitis, or garget, an inflammation of the udder, is the cause of great loss to the dairy industry. The objects of these investigations are to develop methods of sanitation and hygiene as a means of controlling the disease, to improve methods of diagnosis, to study vaccine therapy in order to develop an effective method of immunization against the disease, and to study modes of transmission of the disease. Recent bacteriological findings and the development of a chemical diagnostic test have been of great value in detecting mastitis in dairy herds, thus assisting owners in handling their breeding and dairy operations in a more efficient manner.

(d) Anaplasmosis Investigations.--Anaplasmosis is a disease of cattle somewhat similar to tick fever. It was definitely recognized in the United States in 1924 and now exists in about 18 States. Control measures employed in other countries are not applicable to this country. The objective in these investigations is to determine the modes of transmission of the disease and to develop a serological test for the diagnosis of the carrier animals. Although means of partially controlling the disease have been found, the development of an immunizing agent that is both safe and effective is an object of these investigations, as is also the determination of effective therapeutic means of combating the disease and freeing the carrier animal of infection.

(e) Rabies Investigations.--This project covers studies on the diagnosis and methods of control of rabies in dogs and other animals. In recent years particular attention has been given from time to time to a study of the efficacy of the prophylactic vaccination of dogs as a means of controlling outbreaks of the disease.

(f) Anthrax Investigations.--Present investigations under this project are intended to completely evaluate on a comparative basis the different types of anthrax biologics that are available at the present time, consideration being given to safety, possibility of sensitization, rapidity of immunity production, and degree and duration of immunity. This information is needed by veterinarians and livestock sanitary officials to permit a scientific determination of the biologic best suited for each particular herd, the attending circumstances surrounding which may be different from those of other herds. The information recently obtained, while incomplete, has been of material value in controlling anthrax.

(g) Swine Erysipelas Investigations.--It has been found in recent years that swine erysipelas in the acute and chronic form exists in a number of the States. These investigations are conducted in an endeavor to improve on the agglutination test for the diagnosis of the disease so that this may be made available for a practical field test for the diagnosis of the disease. Studies are being made on the factors that enhance the pathogenicity of the causative agent of the disease and on outbreaks of the disease in the field, the latter to gain information on control measures. Experiments are being conducted to develop a safe and effective means of vaccination where the disease occurs in large hog-breeding and feeding establishments.

(h) Miscellaneous Disease Investigations.--The diseases falling in this group, which include glanders, blackleg, paratyphoid infection of swine, foot-rot, alkali disease, and other miscellaneous diseases and pathological conditions of animals, are at this time subjects for study as occasion demands. While some of these diseases were at one time major problems, earlier special studies resulted in finding effective means for their control. The present activities concerning these diseases are largely those of diagnosis, since proper diagnosis is the first essential in formulating measures to combat outbreaks of disease.

(i) Contagious-Abortion Investigations.--Abortion disease has for many years been growing in importance until it now ranks first among diseases that plague the dairy and cattle-raising industries. The object of this research is to gain sufficient knowledge of the disease to be able to at least reduce its ravages and, if possible, bring it under control and eradicate it.

(j) Stock Poisoning by Plants.--In some localities the losses in livestock on account of poisonous plants are frequently very severe. It has been estimated that the average annual damage from such causes is about one million dollars and in exceptional years may reach several times that figure. Work is being carried on to determine what plants are responsible for these losses and to find means to prevent poisoning or to treat affected animals. Recently the causes of various hitherto unexplained livestock sicknesses have been shown to be due to poisonous plants. The relationship between two such plants and the annual loss of several thousand sheep, together with practical means of avoiding them, has been found. A practical and effective remedy for one deadly plant poison has been determined.

(k) Poultry Disease Investigations.--The principal diseases now under investigation are laryngotracheitis, range paralysis, tuberculosis, pullorum diseases, and fowl pox. These are widespread in distribution and are the cause of heavy losses to the poultry industry. In addition, a number of diseases to which poultry is susceptible but which are of lesser economic importance are subjects for study as suitable material becomes available and facilities permit. The objective is to formulate adequate control measures.

(l) Swamp-Fever Investigations.--Swamp fever is a widely distributed disease of horses and mules which at times has been of economic importance in certain sections of the United States. In 1927 the disease assumed economic proportions in the Mississippi Delta region, and investigations are now being conducted looking to the development of some treatment that will be effective either as a preventive or as a cure for the disease. Work is being conducted to develop a test for the detection of carriers of the infection as a means of controlling and eventually eradicating the disease.

(m) Tuberculosis, Tuberculin, and Reputed Immunizing Agents.--The investigation of animal tuberculosis was one of the earliest major projects of the Bureau of Animal Industry. Much has been learned of the nature of the disease, the manner in which it is spread, the methods of diagnosis, and means of prevention and control. Present methods of eradicating the disease are based on this work. The object of this investigation is to gain knowledge relative to the disease which will make possible its eradication in cattle, hogs, chickens, and other animals affected by the different types of tubercle bacilli.

(n) Types of Tubercle Bacilli.--In the examination of large numbers of tissue specimens from abattoirs tubercle bacilli are frequently found in tissues from cattle, swine, and sheep. Such finds serve the purpose of definitely diagnosing the lesions as being tuberculosis in food-producing animals so that proper disposition of the carcass may be made by the meat-inspection service. In other specimens representing lesions found in tuberculin reactor animals slaughtered in connection with the national program of tuberculosis eradication, the finding of tubercle bacilli confirms the tuberculin test. The object of this investigation is to determine the types of tubercle bacilli, whether bovine, human, or avian, that are found in these lesions, in order to furnish the information necessary from the standpoint of tuberculosis eradication.

(o) Johne's Disease.--Johne's disease (paratuberculosis) is a disease of cattle which, like tuberculosis, is caused by acid-fast microorganisms. Like tuberculosis, infection in the early stage of the disease can not be detected by clinical means, yet these animals may be spreaders of the infection to healthy cattle. While the disease has been recognized in the United States for a number of years, it apparently is becoming more prevalent and is causing considerable loss, especially in the dairy industry. A diagnostic agent similar to tuberculin and known as Johnin was developed in 1914. A commercially prepared intravenous Johnin became available in 1927 but proved rather unsatisfactory. In 1932 the Bureau began the preparation of an intradermic Johnin similar to intradermic tuberculin. This product, while more satisfactory than the intravenous Johnin, is as yet in an experimental stage. The object of this investigation is to improve the intradermic Johnin, looking to the ultimate development of a diagnostic agent as effective as intradermic tuberculin, and to apply this product in the field for the detection of infected animals so they may be removed from the herds.

(p) Methods of Producing Immunization Against Hog Cholera.--At times hog cholera has severely injured the hog-raising industry, losses having reached 6,000,000 hogs (valued at $65,000,000) in a single year. Present methods of immunization are expensive and not invariably safe or successful. A cheaper and more dependable method is being sought, either through improved utilization of virus and serum or through a harmless but effective vaccine.

(q) Modes of Dissemination of Hog Cholera.--Hog cholera is highly contagious. The avenues by which infectious matter is conveyed from sick hogs to well hogs are studied in order to determine where and how infection may be strategically blocked.

(r) Investigations of Periodic Ophthalmia of Equines.--Periodic ophthalmia of equines has been known to exist in the United States for many years and is characterized by a recurring inflammation of the eye which usually terminates in blindness of one or both eyes. The condition is quite widespread, particularly in the Middle West and East. Indications are that the disease is on the increase. While it is rather difficult to estimate the losses occasioned annually by this disease, they are known to be very heavy. Since the value of a horse affected with the disease is very materially reduced and the more valuable the animal attacked the greater will be the monetary loss, a very conservative estimate would set the monetary loss at least at one-half million dollars annually. Little is known about the cause of the disease but it is generally believed to be of an infectious nature of the type of a filterable virus. Research work on periodic ophthalmia is handicapped by the fact that the experiments must be conducted on

horses and mules, which makes the procedure quite expensive. As a result, experimental work, both in this country and abroad, has been very limited and little or no information is available that is of a practical nature in the control of the disease.

2. Investigations of Parasitic Diseases of Animals.--Investigations are conducted on animal parasites, including studies of their morphology, life history, biology, pathogenicity, and of control measures by means of treatment and prophylaxis. The more important parasite groups covered include the protozoa, nematodes, tapeworms, flukes, insects, and arachnids attacking domesticated and game animals, including birds. The basic work makes possible the precise identification and recognition of parasites and gives the information on which to base control measures. Therapy is established on the basis of critical tests of drugs. Work is conducted along the lines indicated in the projects listed below:

(a) Index Catalogue of Medical and Veterinary Parasitology and Maintenance of Parasite Collection.--The object of this project is to maintain a complete catalogue and index of the world's literature on parasitology. This index catalogue provides a basis for research and affords prompt information in answering correspondence.

(b) Poultry Parasite Investigations.--The poultry industry of the United States suffers large losses because of parasites of poultry. The objective of these investigations is to develop methods of protecting the industry from such losses.

(c) Swine Parasite Investigations.--Swine parasites are the cause of large losses to the industry. The object of the work under this project is to lay a foundation of scientific fact on which to build measures for the control of parasites and to make available to the industry the data obtained so that losses may be reduced.

(d) Parasites Causing and Transmitting Anaplasmosis in Cattle.--In 1924 and 1925 it was found that anaplasmosis was prevalent in the United States in areas outside the area in which cattle-fever ticks were present, indicating that the eradication of the cattle tick, although resulting in the suppression of piroplasmosis, did not control anaplasmosis. Consequently the problem of anaplasmosis was made a project for consideration, the object being to ascertain what vectors carry anaplasmosis and to develop control measures of any practical sort.

(e) Ox-Warble Investigations.--The object of this project is to lay a foundation for the eradication of ox warbles from the United States, since these parasites cause losses, principally by damage to hides, amounting to millions of dollars annually.

(f) Liver-Fluke Investigations.--A survey of the fluke situation in 1912 indicated that the sheep liver fluke was prevalent along the Pacific Coast and the Gulf Coast, with extensions up certain river valleys to inland States. More recent surveys indicated that the fluke was spreading and was present in about 30 States, including many which were free from flukes in 1912. The damage to cattle livers has become an important item in connection with the increased value of livers in the treatment of pernicious anemia; hence, the evident need for control of this parasite.

(g) Internal Parasites of Ruminants.--Previous investigations have developed or standardized several treatments for stomach worms and other roundworms of sheep. The object of the project is to ascertain the basic facts in connection with cattle and sheep parasites and to develop treatments and control measures. Parasites cause more losses in sheep than do any other disease agencies and in many places are the limiting factor in sheep production.

(h) Horse Parasite Investigations.--Horses in general are menageries of parasites, many of these parasites being highly injurious and the cause of considerable losses. The object of the work under this project is to lay a foundation of scientific fact on which to build control measures and to make available to the people of the United States the data obtained so that losses may be reduced.

(i) Miscellaneous Parasite Investigations, Including Parasites of Dogs, Cats, Wild Animals, etc.--Parasites of sheep, goats, and cattle are identical in many cases with parasites affecting deer and other wild ruminants, and some of our most important parasites of sheep and cattle have originated as parasites of wild ruminants in recent times. The same is true of parasites of domesticated and wild birds and of other animals, and any competent study of parasites of domesticated animals must take cognizance of parasites of wild animals. A number of parasites of dogs are transmissible to man, and this fact gives the parasites of dogs special importance.

(j) Anthelmintics and Insecticides for the Destruction of Parasites.--The original object of this project was to establish the value of drugs in common use or at least recommended in the literature. This has been done. The next objective was to develop more effective drugs, and this has been done in some cases and is still being carried on effectively. A further objective is to ascertain basic correlations between the efficacy of a drug and the chemical composition and physical properties of the drug, and such investigations are now actively under way.

EMERGENCY FUNDS

Projects	Obligated, 1937
Emergency Relief Appropriation Act of 1935:	
For eradication of liver flukes in sheep and cattle	$77,371
Emergency Relief Appropriation Act of 1936:	
For eradication of liver flukes in sheep and cattle	73,539
Total, Emergency Funds	150,910

(e) ERADICATING TUBERCULOSIS AND BANG'S DISEASE

Appropriation Act, 1938. . . . . $1,603,000
Budget Estimate, 1939. . . . . 1,603,000*

*Together with the unexpended balance of Jones-Connally and Sec. 37 funds (Act of August 24, 1935) - estimated at $6,600,000. See Project Statement and explanation which follows.

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Increase or decrease
1. Eradicating tuberculosis in livestock (including poultry)	$992,678 (a)	$1,032,116(a)	$1,732,116	+$700,000(1)
2. Indemnities for cattle slaughtered on account of tuberculosis.	371,289 (a)	499,884(a)	999,884	+ 500,000(1)
3. Tuberculin testing at public stockyards	65,547	71,000	71,000	---
4. Combating Bang's disease in cattle	(b)	(b)	1,800,000	+1,800,000(1)
5. Indemnities for cattle slaughtered on account of Bang's disease	(b)	(b)	3,500,000	+3,500,000(1)
6. Experimentation in diseases of livestock, etc.	(b)	(b)	100,000	+ 100,000(1)
Total obligated	1,429,514 (c)	1,603,000(c)	8,203,000	+6,600,000(1)
Unobligated balance, regular funds	70,486	---	---	---
Deduct: Estimated unobligated balances Jones-Connally and Sec.37 funds estimated for reappropriation for 1939 under this head	---	---	-6,600,000	-6,600,000
Total regular appropriation	1,500,000 (c)	1,603,000(c)	1,603,000(c)	---

(a) Also financed with special funds (See Table I, which follows).
(b) Financed with special funds (See Table I, which follows).
(c) Exclusive of special funds used for this purpose (See Table I, which follows).

INCREASES AND DECREASES

(1) These are apparent increases; there is a decrease in working funds available. (See statement below, and Table I, which follows.)

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Tuberculosis eradication has been in progress since 1917. Since 1934 both regular and special funds (Jones-Connally and Sec. 37, Act of August 24, 1935) have been used for this purpose. Bang's disease control was inaugurated in the

fiscal year 1935 and this work, together with special experimental work on livestock diseases, as authorized by Section 37, has been financed exclusively with special funds, through the fiscal year 1938. For 1939 the Budget estimates provide for continuation of tuberculosis eradication and Bang's disease control and special experimentation under one consolidated appropriation item, entitled "Eradicating Tuberculosis and Bang's Disease", with a direct appropriation of $1,603,000, the same amount as provided from regular funds in 1938, together with the unexpended balance of the special funds, now estimated at $6,600,000, making in all $8,203,000. For 1938 the combined total of the regular and special funds allotted for these purposes is $15,880,600. Proposed modification in the basis of indemnity payments, beginning July 1, 1938, and a requirement for State cooperation after May 1, 1939, are shown in the language of the item as submitted. Table I, which follows, shows the amounts available from all sources, fiscal years 1934-1939, and Table II shows, by States and Territories, the allotments of funds for tuberculosis and Bang's disease work during the fiscal year 1938. Table III, which also follows, shows the status of the Jones-Connally and Section 37 funds, from which the unexpended balance will be available for 1939.

TABLE I

STATEMENT OF OBLIGATIONS AND ALLOTMENTS FOR ERADICATING TUBERCULOSIS, COMBATING BANG'S DISEASE, AND SPECIAL EXPERIMENTATION IN DISEASES OF LIVESTOCK, FISCAL YEARS 1934-1939.

Projects	Obligations, 1934	Obligations, 1935	Obligations, 1936	Obligations, 1937	Allotments, 1938	Budget estimate, 1939
Eradicating Tuberculosis:						
Regular Funds.....	$3,877,293	$1,966,490	$1,636,817	$1,429,514	$1,603,000	$1,603,000
Jones-Connally and Section 37 ..	- - - -	9,500,000	5,881,934	2,741,876	1,500,000	1,200,000
Total, Eradicating Tuberculosis	3,877,293	11,466,490	7,518,751	4,171,390	3,103,000	2,803,000
Combating Bang's Disease:						
Jones-Connally and Section 37 ..	- - - -	10,687,175	14,737,528	13,681,634	12,627,600	5,300,000
Experimentation in Diseases of Livestock:						
Section 37	- - - -	- - - -	12,655	102,027	150,000	100,000
Total, Regular and Special Funds	3,877,293	22,153,665	22,268,934	17,955,051	15,880,600	8,203,000

TABLE II

ERADICATING TUBERCULOSIS AND BANG'S DISEASE

1938 Allotments
(Combined funds)

State	Eradicating Tuberculosis		Combating Bang's Disease		Total
	Salaries and Expenses	Indemnities	Salaries and Expenses	Indemnities	
Eradicating tuberculosis and combating Bang's disease:					
Alabama	$23,300	$3,000	$80,000	$246,125	$352,425
Arizona	29,300	2,500	14,000	24,700	70,500
Arkansas	12,160	1,000	140,000	166,425	319,585
California	439,846	480,000	4,000	950	924,796
Colorado	20,100	2,000	4,000	34,200	60,300
Connecticut	18,000	20,000	2,000	22,325	62,325
Delaware	3,000	3,000	3,000	30,000	39,000
District of Columbia	124,310	--	184,000	---	308,310
Florida	9,500	4,000	95,000	220,000	328,500
Georgia	18,500	1,000	40,000	98,420	157,920
Idaho	14,000	2,000	42,000	148,200	206,200
Illinois	20,000	40,000	45,000	214,225	319,225
Indiana	39,000	15,000	50,000	223,125	327,125
Iowa	41,700	75,000	111,000	531,000	758,700
Kansas	22,000	5,000	50,000	413,500	490,500
Kentucky	20,000	3,000	40,000	191,750	254,750
Louisiana	10,800	3,000	75,000	343,250	432,050
Maine	22,200	4,000	10,000	45,000	81,200
Maryland	24,000	15,000	40,000	150,000	229,000
Massachusetts	18,800	25,000	1,000	9,000	53,800
Michigan	24,000	5,000	65,000	197,950	291,950
Minnesota	68,000	25,000	190,000	570,000	853,000
Mississippi	18,300	3,000	36,000	150,000	207,300
Missouri	18,000	2,000	178,000	535,000	733,000
Montana	24,000	5,000	35,000	155,000	219,000
Nebraska	51,000	10,000	34,000	137,000	232,000
Nevada	13,000	2,000	13,000	74,700	102,700
New Hampshire	5,500	10,000	8,000	60,000	83,500
New Jersey	15,500	25,000	8,000	30,000	78,500
New Mexico	23,900	2,000	42,000	20,750	91,650
New York	53,000	140,884	60,000	250,750	504,634
North Carolina	10,000	2,000	29,000	96,000	137,000
North Dakota	24,000	20,000	40,000	138,250	222,250
Ohio	48,000	20,000	55,000	328,000	451,000
Oklahoma	27,000	5,000	100,000	620,000	752,000
Oregon	20,000	7,000	120,000	335,900	482,900
Pennsylvania	37,000	60,000	60,000	530,000	687,000

TABLE II - Continued.

ERADICATING TUBERCULOSIS AND BANG'S DISEASE - Continued.

1938 Allotments
(Combined funds) - Continued.

State	Eradicating Tuberculosis		Combating Bang's Disease		Total
	Salaries and Expenses	Indemnities	Salaries and Expenses	Indemnities	
Eradicating tuberculosis and combating Bang's disease - Continued					
Rhode Island . . .	$8,000	$10,000	$1,000	$9,500	$28,500
South Carolina . . .	6,000	1,000	35,000	36,250	78,250
South Dakota . . .	54,000	73,500	20,000	76,000	223,500
Tennessee.	20,000	3,000	81,000	232,000	336,000
Texas	26,000	5,000	95,000	380,000	506,000
Utah	18,800	2,000	35,000	107,900	163,700
Vermont.	30,600	10,000	5,000	19,000	64,600
Virginia	27,000	2,000	145,000	240,000	414,000
Washington	36,600	7,000	95,000	360,065	498,665
West Virginia. . .	14,500	2,000	45,000	52,000	113,500
Wisconsin.	66,400	25,000	200,000	800,000	1,091,400
Wyoming.	7,000	2,000	24,000	87,250	120,250
Alaska	2,000	1,000	--	--	3,000
Hawaii	1,500	1,000	--	--	2,500
Puerto Rico. . . .	100,000	8,000	1,000	1,140	110,140
Total.	1,832,116	1,199,884	2,885,000	9,742,600	15,659,600

Eradicating tuberculosis and combating Bang's disease.	15,659,600
Tuberculin testing at public stockyards	71,000
Special experimentation	150,000
GRAND TOTAL	15,880,600

TABLE III
STATEMENT SHOWING STATUS OF
$150,000,000 JONES-CONNALLY FUNDS
AND $10,000,000 MADE AVAILABLE BY
SECTION 37 OF ACT OF AUGUST 24, 1935.

	Amount
Obligated 1934-1937 and Allotments 1938:	
Elimination of Diseased Cattle:	
Eradicating Tuberculosis	$19,623,810
Combating Bang's Disease.....	51,733,937
Combating Mastitis	876,558
Experimentation in Diseases of Livestock ..	264,682
Total, Elimination of Diseased Cattle	72,498,987
Removal of Surpluses:	
Dairy Products	17,162,280
Cattle Purchases	63,738,733
Total, Removal of Surpluses	80,901,013
Estimated for Reappropriation for 1939:	
For Eradicating Tuberculosis, Combating Bang's Disease, and Experimentation in Diseases of Livestock	6,600,000
Total	160,000,000

CHANGES IN LANGUAGE
AND IN METHOD OF OPERATION

The Budget estimate contemplates that the title of this item be changed from "Eradicating tuberculosis" to "Eradicating tuberculosis and Bang's disease". (See explanation following the project statement.)

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Language relating to cooperation which has been carried in the Agricultural Appropriation Act for a number of years, but which is now surplusage, also has been eliminated. Under the language as submitted for 1939 both the tuberculosis and Bang's disease work are required to be conducted in cooperation with State and Territorial authorities and, if county authorities of farm organizations, associations, etc., as set forth in the language which is omitted, wish to cooperate, they do so through the State authorities. When tuberculosis eradication work was first inaugurated some of the States were not in position to carry on cooperative work and the above language was included in the Appropriation Act so that it might be possible to form organizations of farmers and others to conduct the work. None of the work on tuberculosis or Bang's disease is to be conducted except in cooperation with State and Territorial authorities, as shown by the following language which remains:

"No part of the money appropriated shall be used in compensating owners of such cattle except in cooperation with the supple-

mentary to payments to be made by the State, Territory, county, or municipality where condemnation of such cattle shall take place."

The provision for payments by the cooperating State, Territory, county or municipality is waived, under the language as submitted for 1939, until May 1, 1939, as later explained.

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The language designating specific amounts to be set aside for administrative and operating expenses and for the payments of indemnities is eliminated as it appears that no object will be accomplished by setting forth in the language of the consolidated appropriation item the amounts which may be spent on each project. The General Accounting Office requires that a separate appropriation limitation symbol be used in connection with each specific amount mentioned in the language of an appropriation item, with a resulting increase in accounting work. It is believed that the check which the Secretary of Agriculture maintains on the project expenditures of the various bureaus adequately controls the amounts which are expended on the various projects under a sub-item of appropriation. In addition, the unobligated balance of special funds (Jones-Connally and Sec. 37, Act of August 24, 1935) to be reappropriated is only estimated and therefore the project amounts will be subject to some adjustment when the actual amount of the unobligated balance is determined.

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The words "except as hereinafter provided" are inserted at two points and refer to the following proviso which is inserted:

> "Provided further, That indemnity payments may be made for cattle slaughtered prior to May 1, 1939, even though no payment has been made prior to that date by the State, Territory, county, or municipality where animals are condemned:"

Except as indicated by the foregoing proviso, the following provisions of the regular appropriation item respecting payment of indemnities are continued in effect in the language of the consolidated item as submitted for 1939:

(1) That the Federal indemnity payment shall not exceed one-third of the difference between the appraised value of the animals and the value of the salvage received.

(2) That no Federal payment shall exceed the amount paid or to be paid by the State, Territory, county, or municipality where the animal is condemned.

(3) That in no case shall any payment be more than $25 for a grade animal or $50 for a purebred animal.

The proviso relating to indemnities for cattle slaughtered prior to May 1, 1939, is considered necessary as the special funds (Jones-Connally and Section 37, Act of August 24, 1935) under which payments have been made during the fiscal years 1935 to 1938, inclusive, have carried no such restrictions as indicated above, and most of the States will not be in position to provide funds

for making indemnity payments until their legislatures meet in January, 1939. However, by Department of Agriculture regulation, Federal indemnity payments from special funds have been limited to $25 for grade animals and $50 for pure-bred animals, the same as payments from regular funds. The proviso will permit the Federal Government to make indemnity payments for cattle slaughtered prior to May 1, 1939, even though no payment has been made prior to that date by the State, Territory, county, or municipality where animals are condemned, but, starting July 1, 1938, the remaining restrictions will govern on all indemnity payments the same as they have on regular appropriations in prior years.

The following table gives the best estimate which can be made at this time of the average payment in the fiscal year 1939 under the language of the consolidated item as compared with payments from special funds during the fiscal year 1938.

Estimated Average Federal Indemnity Payment Per Animal

	Tuberculosis	Bang's Disease
Fiscal year 1938:		
From special funds.	$24.34	$36.97
Fiscal year 1939:		
From consolidated funds:		
July 1 to April 30	17.50	20.00
May 1 to June 30	17.50	18.00

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The language "and that no payment shall be made unless the owner has complied with all lawful quarantine regulations" is eliminated as no longer necessary, all work being conducted under State laws in cooperation with the States.

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The following proviso is added in order that there may be continued the scientific experimentation in diseases of livestock authorized by Section 37 of the Act of August 24, 1935:

> "Provided further, That not to exceed $100,000 of the amount herein made available may be used for continuation of scientific experimentation in diseases of livestock as authorized by section 37 of the Act of August 24, 1935". (49 Stat. 775-776) (50 Stat. 404-405).

The amount requested for livestock disease experimentation is $50,000 less than the sum provided for the fiscal year 1938.

WORK UNDER THIS APPROPRIATION

1. Eradicating Tuberculosis in Livestock (Including Poultry).--The campaign for the eradication of tuberculosis in cattle, which was started in 1917 in cooperation with the various State livestock sanitary authorities, had, on December 1, 1937, progressed to the point where 3,039 counties in the United States were in the Modified Accredited Area; that is, where the degree of infection of tuberculosis among the cattle has been found to be less than

one-half of one percent. This is 99 percent of all the counties in the United States. In 46 States all counties are in that status, and the work is progressing in a satisfactory manner in all of the remaining 10 counties in South Dakota and in nearly all of the 22 remaining counties in California. Work is also being conducted in Puerto Rico. In order that progress already made may be maintained, it is necessary from time to time to conduct a certain amount of retesting of the cattle in the Modified Accredited Area. It is also necessary to continue work on the control and eradication of tuberculosis in poultry and swine caused by the avian type of tubercle bacillus, which is very prevalent in the Central and North Central States. State and county funds for tuberculosis-eradication work amount to about $4,500,000 a year. Since the cooperative work was undertaken in 1917 approximately 3,600,000 reactors have been removed from the herds of cattle in this country. During the fiscal year 1937 tuberculin tests were applied to 13,750,308 cattle, disclosing 93,104 reactors or seven-tenths of one percent. On December 1, 1937, there were approximately 6,400,000 herds, containing about 61,000,000 cattle. Of this number, about 272,000 herds, containing about 3,800,000 cattle, were fully accredited as tuberculosis-free and about 6,000,000 herds containing about 53,000,000 cattle had passed at least one negative test. State and county funds for this work amount to about $4,500,000 per year. According to the records of the Meat Inspection Division of the Bureau of Animal Industry, there continues to be a reduction in the number of cattle showing lesions of tuberculosis on post-mortem examination. During the fiscal year 1937 approximately 11,000,000 cattle, exclusive of known reactors, were slaughtered under Federal supervision, of which only 15,816, or 0.15 percent, showed any evidence of tuberculosis. Of the total number of cattle showing any infection, 4,003 were either condemned as unfit for food or passed for cooking purposes. This is about 0.04 percent of all the cattle slaughtered under Federal supervision during the year.

Tuberculosis among poultry is very prevalent in the Central and North Central States, and in some counties where all the flocks of poultry have been tuberculin tested the flock infection has been found to be as high as 75 percent This disease is caused by what is known as the avian type of the tubercle bacilli, which is readily transmitted to swine. In recent years it has been found that this type of bacillus may progress to a point in swine where the disease will become generalized, but most of the swine show evidence of only a mild form of the disease on post-mortem examination, usually affecting the cervical or mesenteric lymph glands. Avian tuberculosis is particularly difficult to eradicate because of its natural power of resistance. It has been found that these bacilli will live for many months in the soil if protected by dirt or other material. The owners of flocks of poultry are furnished helpful information for controlling this disease. About 15 Bureau veterinarians devote practically all their time to the avian tuberculosis project and during the fiscal year 1937 inspected about 1,600,000 fowls on about 12,000 farms and reported infection in about 3,000 flocks. The records of the Meat Inspection Division of the Bureau of Animal Industry show that during the fiscal year 1937 there was some decrease in the percentage of hogs showing any evidence of tuberculosis on post-mortem examination and that of the approximately 36,200,000 hogs killed under Federal supervision, 9.3 percent showed some evidence of tuberculosis. Of the more than 36,000,000 hogs killed under Federal supervision, about 15,000 or 0.04 percent, were condemned, and 18,000, or 0.05 percent, were passed for cooking purposes under Federal supervision.

There is another disease causing some losses among cattle owners which is caused by an acid-fast bacillus and produces what is known as paratuberculosis, or Johne's disease. It is difficult to make a diagnosis of this disease but some herds are being tested each year with a product known as "johnin" and the reactors are removed and condemned. The owners receive a Federal and a State payment for them. During the fiscal year 1937 about 2,100 cattle on 53 farms in 13 States were tested with johnin, disclosing 136 reactors, or 6.5 percent.

2. Indemnities for Cattle Slaughtered on Account of Tuberculosis.--In most States provision has been made for payment to owners of tuberculous cattle by the Federal Government when the State makes a similar or greater payment, but starting with the fiscal year 1935 it has been possible for the Federal Government to make such payment in cases where no State payment is made. It has therefore been possible to extend the work to sections of the country where no local funds are available. During the fiscal year 1937 State, county, and Territorial appropriations amounted to approximately $4,500,000, of which about $1,000,000 was for indemnity. The maximum Federal payment is $25 for grade cattle and $50 for registered purebred cattle. Beginning July 1, 1938, it is proposed that no Federal payment shall be more than one-third of the difference between the appraised value of the animal and the salvage, and beginning May 1, 1939, no Federal payment shall be made in an amount exceeding the amount paid by the cooperating State, Territory, or country.

3. Tuberculin Testing at Public Stockyards.--The purpose of this work is to supervise the tuberculin testing of cattle at public stockyards to detect and remove tuberculous animals, thereby preventing their further transportation and the spread of tuberculosis to farm herds at destination, and to expedite the movements through the yards to slaughtering establishments of animals which have reacted to the tuberculin test.

4. Combating Bang's Disease in Cattle.--The campaign for combating Bang's disease in cattle was started in July 1934 with emergency funds. While the States have shown much interest in this work, the Federal Government has supplied most of the funds to carry it on and for the payment of indemnities to owners of condemned animals. That there is a demand for continuance of the campaign is evidenced by the fact that the States have provided for the fiscal year 1938 approximately $2,000,000 to conduct the work. States in which the laws provide for indemnity payments are Delaware, Florida, Maine, Maryland, New Hampshire, New York, Pennsylvania, Rhode Island, Virginia, Washington, and Wisconsin, and it is expected that additional States will appropriate funds for this purpose at the next session of their legislatures, most of which do not meet until January, 1939. The disease is regarded by cattlemen generally to be a very serious menace to the cattle industry and there is a very great desire on their part that the project be continued. During the fiscal year 1937 agglutination blood tests were applied to approximately 8,000,000 cattle, of which number about 398,000, or 5 percent, were found to be reactors, as compared to 7 percent for the previous year. These figures include a considerable number of retests. This project is conducted on an individual herd basis and also under what is known as the area plan. Most of the work thus far has been conducted on the individual herd basis, which is a voluntary one as far as the Federal Government is concerned. When the area plan is

adopted, the work is conducted under State rules and regulations and is usually taken up in localities where the disease does not exist to a very great extent and where the sentiment of the cattle owners is very much in favor of conducting the work on that basis. The area project has been taken up in about 200 counties, located in 17 States, and about 1,400,000 cattle have been tested in those counties, disclosing a degree of infection of about 3.5 percent. A complete retest of the cattle has been conducted in about 40 of these counties, and reports indicate an infection of about 0.6 percent. The demand for work under the area plan is increasing in several States. At the close of November, 1937, there were approximately 8,100,000 cattle, located in about 813,000 herds, under supervision. This is an increase of approximately 50 percent in the number of herds and 27 percent in the number of cattle as compared to a year ago. In three States more than 50 percent of the breeding cattle over six months of age are under supervision. In 11 States from 25 to 50 percent of the cattle are under supervision, while in 16 States the percentage runs from 10 to 25. This leaves 18 States in which less than 10 percent of the cattle are under supervision. The average for the entire country is approximately 15.4 percent. A survey has recently been completed in five Midwestern States to determine the progress being made in reducing the percentage of infection in herds where reactors to the Bang's disease test have been found. This survey covered approximately 10,500 herds, containing about 237,000 cattle. There was some infection in every herd, the average infection being about 25.7 percent. After the reactors were removed as a result of the first, second, and third tests, another test was applied and the degree of infection was found to have been reduced to 2.5 percent. Since the Bang's disease program was undertaken in July, 1934, agglutination blood tests have been applied to approximately 21,000,000 cattle, of which about 1,368,000 have been removed as reactors.

5. Indemnities for Cattle Slaughtered on Account of Bang's Disease.--Owners of cattle that react to the test for Bang's disease, and who comply with the necessary requirements, receive a Federal payment in addition to the salvage derived from the slaughter of the animals. The maximum Federal payment is $25 for grade cattle and $50 for registered purebred cattle. In a few States the owners also receive a payment from the State. In no instance, however, does the owner receive from all sources, including the salvage, a total payment greater than the appraised value of the animal. During the fiscal year 1938 such State payments will be made in various amounts in 11 States. At present there is no requirement that the States make a payment in addition to the Federal payment, but after May 1, 1939, the Federal payment will not exceed the amount paid by the State. Beginning July 1, 1938, the Federal payment will not exceed one-third of the difference between the appraised value and the salvage. During the fiscal year 1937 the average Federal payment was $26.45. In addition to this, the owners received an average salvage of $27.94. The average appraisal of cattle that reacted and were slaughtered was $70.67. Nine percent of the reactors were registered purebred animals.

6. Experimentation in Diseases of Cattle.--This activity was started in 1936 with funds authorized by Section 37 of the Act of August 24, 1935. Two alleged remedies for Bang's disease which have been widely advertised have been subjected to critical tests which are now almost to the stage of completion. Researches in connection with calfhood vaccination against Bang's disease and the transmission of infectious abortion to cattle by swine have yielded considerable information thus far, but a large amount of work remains to be done in

connection with these researches, as well as on other problems relating to Bang's disease, mastitis, anaplasmosis, warts, and nutritional deficiencies of cattle.

(f) ELIMINATION OF DISEASED CATTLE, DEPARTMENT OF AGRICULTURE.

This item, which was included under the Miscellaneous section of the 1938 Appropriation Act, has been transferred in the 1939 Estimates to follow "Eradicating tuberculosis and Bang's disease," Bureau of Animal Industry, and is there bracketed out and no estimate is submitted under this head for 1939, the work of tuberculosis eradication, Bang's disease control, and special experimentation having been estimated for in 1939 under the preceding item, "Eradicating tuberculosis and Bang's disease."

(g) ERADICATING CATTLE TICKS

Appropriation Act, 1938	$513,940
Budget Estimate, 1939	503,940
Decrease	10,000

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Decrease
Eradicating cattle ticks	$497,648	$513,940	$503,940	-$10,000 (1)
Unobligated balance	16,292	-----	-----	-----
Total	513,940	513,940	503,940	- 10,000

DECREASE

(1) The decrease of $10,000 in this item for 1939 will be met by a curtailment in the number of temporary employees of the Bureau engaged in tick eradication work.

CHANGE IN LANGUAGE

The Budget estimates propose the elimination of the words "all necessary expenses for", as they are considered superfluous, inasmuch as the introductory clause to "Salaries and expenses" contains the necessary authority for the employment of persons and means in the District of Columbia and the field.

WORK UNDER THIS APPROPRIATION

This appropriation is used cooperatively for the payment of salaries and travel and office expenses of veterinarians and agents in Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, Texas, and in Puerto Rico in the

eradication of the cattle-fever tick which spreads splenetic fever infection among cattle. As counties are freed of this tick they are released from Federal quarantine and their livestock may then be shipped to markets without restrictions. The States contribute large sums to this work. The work is conducted under State laws and regulations, Federal money being expended for supervision, thus insuring that all measures of eradication be so carried out as to warrant the release of cleaned areas from quarantine.

EMERGENCY FUNDS

Projects	Obligated, 1937
Emergency Relief Appropriation Act of 1935:	
For elimination of cattle fever tick ..	$85,295
Emergency Relief Appropriation Act of 1936:	
For elimination of cattle fever tick ..	494,130
Total, Emergency Funds	579,425

(h) HOG CHOLERA CONTROL

Appropriation Act, 1938	$127,192
Budget Estimate, 1939	124,192
Decrease	$3,000

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Decrease
Hog cholera control.....	$119,194	$127,192	$124,192	- $3,000 (1)
Unobligated balance	7,998	----	----	----
Total	127,192	127,192	124,192	- 3,000

DECREASE

(1) The decrease of $3,000 in this item for 1939 will result in a curtailment by approximately one man in the amount of veterinary service now being rendered to the swine industry.

WORK UNDER THIS APPROPRIATION

Under this appropriation work is carried on in the control and eradication of hog cholera in the field by demonstrations, the formation of organiza-

tions, and other methods, either independently or in cooperation with farmers' organizations and State and county authorities. Meetings are held and demonstrations are made from time to time to gatherings of farmers and others interested in preventing losses. Outbreaks are investigated, swine diseases diagnosed, owners instructed in methods to prevent losses, and local veterinary practitioners assisted in the use of the preventive treatment and in diagnosing swine ailments. In sections of the South where no veterinary services are available, Bureau inspectors immunize swine in addition to their other duties, and in States where the laws and regulations permit laymen are trained to immunize swine.

(i) INSPECTION AND QUARANTINE

Appropriation Act, 1938	$680,000
Budget Estimate, 1939	680,000

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
1. Scabies eradication	$158,798	$167,280	$167,280
2. Control over interstate shipment of livestock for the purpose of preventing the spread of communicable diseases	291,366	305,205	305,205
3. Enforcement of the 28-hour law.....	28,679	29,795	29,795
4. Determination by inspectors in the field of the existence of diseases	20,430	20,930	20,930
5. Inspection and quarantine of import animals	95,189	79,920	79,920
6. Supervision over the importation of hides and other animal by-products, forage, etc.	67,910	70,830	70,830
7. Inspection and testing of animals for export	3,197	6,040	6,040
Unobligated balance	12,479	----	----
Total	678,548	680,000	680,000

CHANGE IN LANGUAGE

The Budget estimates provide for the elimination of the words "all necessary expenses for". This language is believed to be superfluous inasmuch as the introductory clause to "Salaries and expenses" contains the necessary authority for the employment of persons and means in the District of Columbia and the field.

WORK UNDER THIS APPROPRIATION

General.--Activities under this appropriation include eradication of scabies and dourine in cooperation with the various States; the investigation of reported outbreaks of diseases among livestock to determine whether they are communicable and, if so, assisting local authorities in their control and eradication; the application of diagnostic tests in the field and in the laboratory; control over interstate movements of livestock in order to prevent the dissemination of infections, which includes inspection at the principal market centers; administration of the 28-hour law to prevent cruelty to animals in interstate transportation; inspection and testing of livestock intended for export to determine their freedom from disease, and the inspection of vessels on which they are to be transported; the inspection and quarantine of livestock offered for importation; control over import animal by-products, hay, and straw to prevent the introduction or dissemination of the contagions of livestock diseases; and the administration, jointly with the Treasury Department, of Section 306 of the Tariff Act of 1930, prohibiting the importation of domestic ruminants or swine, or chilled or frozen fresh meats derived therefrom, from countries where foot-and-mouth disease or rinderpest exists.

1. Scabies Eradication.--The purpose of this project is the complete eradication of scabies or mange, a highly contagious skin disease of sheep and cattle, which if unchecked causes great financial losses. Eradication work is carried on in cooperation with the States involved under written agreements with State authorities. It consists of inspecting all sheep or cattle, as the case may be, in areas where scabies exists or has existed recently and causing all animals found to be infected or exposed to be dipped under the supervision of Federal or State employees. Further inspections on the ranges or premises are then made in order that any infection that may have escaped may be promptly discovered and the animals properly treated. Quarantines of premises or specified areas where infection has been determined to exist are applied by State authorities in order to control movements of livestock until the required treatments have been accomplished, and, when necessary to prevent the spread of the disease to other States, Federal quarantine also is imposed. Inspections of cattle and sheep in the areas involved are continued for several seasons following the cleanup campaign to insure against the existence of obscure centers of infection.

2. Control over Interstate Shipment of Livestock for the Purpose of Preventing the Spread of Communicable Diseases.--The purpose of this project is to detect communicable diseases of livestock at public stockyards and to treat the animals and premises and the transporting vehicles in such a manner as to minimize the danger of spreading such diseases; to furnish information to livestock sanitary officials to assist them in eradicating the disease at point of origin; to supervise the application of tests used to detect communicable diseases in animals shipped from the stockyards to country points and to protect animals so shipped against such diseases. The discovery at public stockyards of shipments of livestock affected with communicable diseases is a very important factor in tracing infection back to its source. In a great many instances the discovery at public markets is the first knowledge gained of the existence of infectious disease in the district of origin. Notice is sent by Federal

employees to State or local authorities enabling them to take steps promptly to localize and eradicate outbreaks which otherwise would become widespread before information concerning them could reach the authorities. This project also covers the enforcement of the animal quarantine laws prohibiting the interstate movement of animals affected with or exposed to contagious, infectious, or communicable diseases.

3. Enforcement of the 28-Hour Law.--The 28-hour law is designed to lessen cruelty to animals while in course of interstate transportation by preventing carriers from confining livestock for a period exceeding 28 consecutive hours without unloading in a humane manner into properly equipped pens for feed, water, and rest for at least five consecutive hours, except in cases where the confinement may be extended to 36 hours upon written request of the shipper.

4. Determination by Inspectors in the Field of the Existence of Diseases.--Under this project the Bureau assists State authorities in investigating diseases among livestock that appear to be communicable and in control and eradication work when such diseases are found to exist. Most prominent among these are dourine and encephalomyelitis of horses and anthrax. The procedure depends upon the particular disease found to exist. Inspectors in the field cooperate in making diagnoses, which in some cases include drawing blood for forwarding to the laboratory for test, arranging for the treatment or the destruction of animals affected, and disseminating information among owners concerning measures to be taken. All reports of suspected cases of foot-and-mouth disease are carefully investigated.

5. Inspection and Quarantine of Import Animals.--The law requires that inspections be made of all livestock offered for importation. Accordingly, inspectors are assigned to stations along the international boundaries and on the seacoasts to inspect animals, examine accompanying certificates, and when necessary place the livestock in quarantine and maintain them under observation during specified periods. Animals in quarantine are subjected to certain diagnostic tests. Those found to be affected with or to have been exposed to any communicable disease are refused entry and are returned to the country of origin or destroyed. Vessels having on board live animals as sea stores originating in countries where foot-and-mouth disease or rinderpest exists are not permitted to dock until the animals have been slaughtered and the spaces occupied by them disinfected under supervision.

6. Supervision over the Importation of Hides and Other Animal By-products, Forage, etc.--Several serious diseases of livestock such as foot-and-mouth disease, rinderpest, surra, and contagious pleuropneumonia, from which the United States is entirely free, exist in many countries with which we have active trade relations. In order to prevent the introduction of these diseases through the medium of imported materials, supervision and control are exercised over animal by-products, hay, straw, etc., offered for entry. All such products are held by the Customs Service for action by Bureau inspectors, who indicate whether they may be released, or must be subjected to quarantine or destruction, or may proceed to approved establishments where they are disinfected in process of manufacture. A most important duty is to prevent the landing of any chilled or frozen fresh meats, whether sea stores or cargo, originating in countries where foot-and-mouth disease or rinderpest exists which are prohibited entry

under the tariff law. Measures are also taken to prevent the landing of garbage derived from such meats.

7. Inspection and Testing of Animals for Export.--The law provides that freedom from disease of domestic ruminants and swine intended for export must be established and that vessels on which they are to be transported must be so equipped as to insure the safe and humane handling of the animals. Inspectors in the field and at ports of embarkation make the necessary inspections, apply diagnostic tests, and take measures to comply with any additional requirements of the receiving countries. Space and facilities on the vessels are inspected and must be approved before embarkation is permitted.

(j) MEAT INSPECTION

Appropriation Act, 1938	$5,433,000
Budget Estimate, 1939	5,412,600
Decrease	20,400

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Decrease
1. Meat-inspection operations at packing plants under the Federal meat-inspection service	$5,065,842	$5,287,305	$5,266,905	- $20,400 (1)
2. Determination of adulterations and other objectionable conditions in meat and meat food products by laboratory analysis	77,872	88,600	88,600	----
3. Inspection of imported meats and meat food products	28,764	29,775	29,775	----
4. Chemical, pathological, and zoological investigations relating to meat inspection.....	25,494	27,320	27,320	----
Unobligated balance	60,222	----	----	----
Total	5,258,194	5,433,000	5,412,600	- 20,400

DECREASE

(1) The decrease of $20,400 in this item for 1939 is in the allotment for "Meat inspection operations at packing plants under the Federal meat inspection service". This decrease will of necessity be met by an adjustment in personnel, inasmuch as about 98 percent of meat-inspection funds are used for salaries.

CHANGE IN LANGUAGE

The Budget estimates provide for the following revision in the last clause of this paragraph:

> including the purchase of printed tags, labels, stamps, and certificates [printed in course of manufacture] without regard to existing laws applicable to public printing.

This change is submitted in order to comply with the decision A-84106, dated May 5, 1937, of the Acting Comptroller General, in which he held that the language in the Appropriation Act as now worded is not adequate to show that Congress intended to authorize the purchase of these articles elsewhere than at the Government Printing Office. The language as it now stands permits the purchase of tags, etc., "printed in course of manufacture", but the Acting Comptroller General, in the decision mentioned, ruled that the printing which has been obtained commercially under the provisions of the present language is not "in the course of manufacture", since such printed tags, etc., are not generally sold to the public. While the Government Printing Office made an attempt to adapt its equipment to the printing of these articles for use in meat inspection and billed the Department for the cost of these adjustments, it has as yet done none of the printing but has approved a release to have the work done outside in the case of each requisition presented. Under present conditions it seems very probable that similar future orders would continue to be released so that they might be done commercially. It therefore seems desirable to amend the language of the meat-inspection item so that these funds may be charged with the expense of this printing regardless of where such printing is done.

WORK UNDER THIS APPROPRIATION

General.--The purpose of the Meat Inspection Service is to eliminate and dispose of carcasses and meat food products found to be diseased, unwholesome, or otherwise unfit for use as human food; to see that meat and meat food products for human consumption are prepared under conditions of proper cleanliness; to guard against the use of harmful dyes, chemicals, and other deleterious substances; to prevent the use of false or misleading names or statements on labels; and to supervise the interstate transportation, exportation, and importation of meat and meat food products.

1. Meat Inspection Operations at Packing Plants Under the Federal Meat Inspection Service.--The object of this work is to see that the laws and regulations governing meat inspection are properly observed. The inspection includes ante-mortem and post-mortem examinations of cattle, sheep, swine, goats, and horses to detect disease or other conditions which might render any of the meat or organs unfit for food purposes; enforcement of sanitary requirements; reinspection of meat and products throughout the stages of the processing, preparing, and packing operations and the inspection of ingredients, spices, and other substances added to meat and meat food products; custody, including supervision of the destruction of food purposes of all condemned animals, carcasses, parts thereof, and meat food products; and supervision of the labeling and marking of meat and meat food products.

2. Determination of Adulterations and Other Objectionable Conditions in Meat and Meat Food Products by Laboratory Analysis.--The purpose of this project is to ascertain by laboratory analysis whether meat and meat food products which are prepared at official establishments or at plants operated under certificates of exemption and imported meat and meat food products are adulterated or contain prohibited or otherwise objectionable materials; to determine whether water and ice used in the preparation of meat and meat food products are clean and potable; and to determine the fitness of curing agents, ingredients, spices, and other substances intended for use in preparing meat and meat food products.

3. Inspection of Imported Meats and Meat Food Products.--The purpose of this project is to see that only meat and meat food products are accepted for importation which have been properly certified from abroad, are sound, healthful, wholesome, and otherwise fit for use as human food, and are truthfully labeled.

4. Chemical, Pathological, and Zoological Investigations Relating to Meat Inspection.--The principal purpose of this project is to conduct research and investigations for the scientific determination as to the character and importance of abnormal conditions encountered in ante-mortem, post-mortem, and subsequent inspections of food animals and meat and meat food products.

(k) VIRUS-SERUM-TOXIN ACT

Appropriation Act, 1938	$218,712
Budget Estimate, 1939	218,712

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
Control of manufacture, importation and shipment of virus, serums, toxins, etc.....	$215,284	$218,712	$218,712
Unobligated balance	3,428	- - -	- - -
Total	218,712	218,712	218,712

WORK UNDER THIS APPROPRIATION

This item provides for the enforcement of the provisions of the Virus-Serum-Toxin Act, approved March 4, 1913, regulating the preparation, sale, barter, exchange, or shipment of viruses, serums, toxins, or analogous products produced in the United States and the importation of such products intended for use in the treatment of domestic animals. Careful attention is given to sanitation, labeling, and the testing of the finished products for purity and potency.

Establishments desiring to produce veterinary biologics for interstate shipment are required by law to hold a United States veterinary license. The holders of such licenses must at all times comply with the regulations of the Secretary of Agriculture as to personnel, construction of plant, methods of production, and the like. Regulations have also been issued by the Secretary of Agriculture governing the importation of veterinary biologics from foreign countries. Bureau inspectors directly supervise all operations performed by licensed establishments in the production of anti-hog-cholera serum and hog-cholera virus. Establishments producing other biologics are inspected periodically.

(1) MARKETING AGREEMENTS WITH RESPECT TO HOG CHOLERA VIRUS AND SERUM

Appropriation Act, 1938 ..... $30,000 (a)
Budget Estimate, 1939 ..... 30,000 (a)

(a) Transferred and payable from the unobligated balance of the appropriation provided by Sec. 12 (a), Title 1, of the Agricultural Adjustment Act of May 12, 1933. (See item "Salaries and Expenses, Agricultural Adjustment Administration".)

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
Marketing agreements with respect to hog cholera virus and serum	$13,149	$30,000	$30,000
Received by transfer from "Salaries and Expenses, Agricultural Adjustment Administration"	-13,149	-30,000	-30,000
Total	- - -	- - -	- - -

CHANGE IN LANGUAGE

The language of this item is identical with the 1938 act, except that fiscal year "1938" has been changed to "1939".

WORK UNDER THIS APPROPRIATION

This item provides funds for the enforcement of sections 56 to 60, inclusive, of the Act approved August 24, 1935 (7 U.S.C. 851-855), entitled "An Act to amend the Agricultural Adjustment Act and for other purposes". Such marketing agreements are intended to insure the maintenance of an adequate supply of anti-hog-cholera serum and hog-cholera-virus for hog producers and to aid in making other improvements in trade conditions. The Department exercises supervision over agencies that may be established under the provisions of such

agreements, receives reports of their activities, and reviews their acts, orders, etc.

(m) PACKERS AND STOCKYARDS ACT

Appropriation Act, 1938 ..... $381,879
Budget Estimate, 1939 381,879

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
Enforcement of the Packers and Stockyards Act	$362,354	$381,879	$381,879
Unobligated balance	19,525	----	----
Total	381,879	381,879	381,879

CHANGES IN LANGUAGE

The Budget estimates propose striking out the words "necessary expenses in", which are considered superfluous inasmuch as the introductory clause to "Salaries and expenses" contains the necessary authority for the employment of persons and means in the District of Columbia and the field.

WORK UNDER THIS APPROPRIATION

This appropriation provides for the protection of producers against sundry losses by seeing to it that applicants are financially able to fulfill the obligations they will incur as licensees before licenses are issued to them; as well as for the protection of producers and consumers by the elimination of unfair, deceptive, and fraudulent practices and devices in the marketing of live poultry, and by the establishment of just and reasonable rates and charges for services rendered in connection with the marketing of live poultry in designated cities and areas. Applicants who will incur financial obligations are required to submit financial statements, and, if these are not satisfactory, audits of the records are made and hearings held, on the basis of which a determination is made as to the issuance of a license. Licensees are required to maintain adequate books and records to disclose all the transactions involved in their business relating to the handling of live poultry and to file annually reports setting out the results of their operations. Audits of the records are made by Bureau accountants from time to time. Where licensees are engaged in rendering services for which rates and charges are made, investigations are conducted and hearings held for the purpose of determining the reasonableness and justness of such rates and charges, and any that are found to be unreasonable and unjust are prohibited and proper rates and charges prescribed. Complaints received from producers, shippers, and others are

investigated and, if the facts warrant, hearings are held with a view to taking disciplinary action against the licensees engaged in unfair practices or to award reparation to producers or shippers who have been damaged by such practices. Supervision is maintained over the scales used by licensees in weighing live poultry on which payment to producers and others is based, and the weighing operations are closely observed for the purpose of detecting any evidence of false or fraudulent practices. The scales are required to be tested regularly under supervision of a Bureau employee.

(n) ERADICATION OF FOOT-AND-MOUTH AND OTHER CONTAGIOUS DISEASES OF ANIMALS

This item continues the availability of the unexpended balance of the appropriation of $3,500,000 made in 1924 to be used in case of an emergency arising from an outbreak of foot-and-mouth or other contagious diseases of animals. The unexpended balance on June 30, 1937, was $1,315,159. No expenditures are contemplated during the fiscal year 1938 unless an emergency arises, but the availability of this fund is absolutely essential to insure protection of the American livestock industry should an outbreak occur.

COMPLETE BUREAU STATEMENT OF A.A.A. AND EMERGENCY FUNDS

A. Direct Allotments

(1) Agricultural Adjustment Administration Allotments

Projects	Obligated, 1937	Estimated obligations, 1938	Estimated obligations, 1939
Agricultural Adjustment Administration:			
Salaries and Expenses:			
For Sixth World's Poultry Congress 1936 (traveling expenses of official delegates, authorized by Act of June 20, 1936)	$5,059	- - -	- - -
Marketing agreements, hog-cholera virus and serum	13,149	$30,000	$30,000
Total, A.A.A. funds	18,208	30,000	30,000

(2) Emergency Fund Allotments

Projects	Obligated, 1937	Estimated obligations, 1938
Emergency Relief Appropriation Act, 1935:		
For elimination of cattle fever tick.....	$85,295	- - -
For elimination of liver flukes in sheep and cattle.....	77,371	- - -
For physical improvement at Chinsegut Hill Sanctuary, Brooksville, Fla.	269	- - -
Total Emergency Relief Act, 1935	162,935	- - -
Emergency Relief Appropriation Act, 1936:		
For elimination of cattle fever tick	494,130	- - -
For eradication of liver flukes in sheep and cattle	73,539	- - -
Total Emergency Relief Act, 1936	567,669	- - -
Public Works Allotments (National Industrial Recovery Act):		
For completion of physical improvement begun in 1934:		
Brooksville, Florida:		
Cattle barn, feed lots, silos, etc.	7,500	- - -
Beltsville, Maryland:		
Nutrition laboratory - repair and extension of water system; reconditioning farm power line; completion of poultry fattening building; farm roads and bridges; goat barn and milk production equipment; moving hog equipment; physical improvements for poultry production record project; physical improvements for turkey breeding, nutrition, and management project; consulting engineering and architectural services and overhead expenses for Beltsville experimental farm; transportation and supervision of labor furnished by F.E.R.A. used in fence, water supply, sewer, and road construction and in clearing land; transient camp for F.E.R.A. labor	2,886	$285
Total, P.W.A. Allotments (National Industrial Recovery).....	10,386	285

Projects	Obligated, 1937	Estimated obligations, 1938
Public Works Administration (Emergency Appropriation Act, 1935):		
Beltsville, Maryland:		
Completion of poultry fattening building	$19,363	$397
Nutrition laboratory - repair and extension of water system; reconditioning farm power line; completion of poultry fattening building; farm roads and bridges; goat barn and milk-production equipment; moving hog equipment; physical improvements for poultry-production record project; physical improvements for turkey breeding, nutrition, and management project; consulting engineering and architectural services and overhead expenses for Beltsville experimental farm; transportation and supervision of labor furnished by F.E.R.A. used in fence, water-supply, sewer, and road construction and in clearing land; transient camp for F.E.R.A. labor.....	146,687	2,025
Poultry building; completion of poultry-fattening building; physical improvements for poultry record-of-performance project.....	720	- - -
Fundamental poultry research building; repair and extension of farm water system; completion of poultry-fattening building; physical improvements for turkey breeding, nutrition, and management project	25,666	- - -
Moving Bethesda station to Beltsville..	3,304	- - -
General completion of entire poultry plant, including sidewalks, painting, road drainage, storage shed, and hard surfacing roads	10,214	2,001
Total, Public Works Administration (Emergency Appropriation Act, 1935).	206,454	4,423
Total, Emergency Funds	947,444	4,708

B. Indirect Allotments
(Financed through other Government agencies)

Projects	Obligated, 1937	Estimated obligations, 1938
Emergency Conservation Work (authorized by Acts of March 31, 1933, and April 8, 1935; allotment through War Department): Work of Civilian Conservation Corps in clearing land, building roads, and constructing fences, drainage ditches, pipe-line, etc., at livestock experiment stations at Beltsville, Md., and Brooksville, Fla.	$175,350	$140,400

PASSENGER-CARRYING VEHICLES

The authorization for the purchase of passenger-carrying vehicles for the Bureau of Animal Industry contemplates a decrease of $5,305 ($71,455 in 1938; $66,150 estimated for 1939). This $66,150 will permit the Bureau to replace 119 old passenger vehicles and to purchase 11 additional passenger vehicles to replace 11 trucks at an average cost of $509. each, after exchange allowances are deducted. The 11 trucks are of the pickup type, 1/2-ton capacity. At the time of purchase this type of vehicle was believed to be most suitable for use by veterinary inspectors in certain localities for travel to farms, premises, and dipping vats. The inspectors were then required to carry with them a considerable quantity of testing material, supplies and equipment, but the nature of the work has changed and they are no longer required to carry with them materials in excess of what can conveniently be carried in a passenger-carrying vehicle. In addition, it has been found that trucks, due to greater vibration on secondary roads, depreciate faster than passenger cars and cause a strain on their operators that is not encountered with the light passenger cars. Efficiency of employees at the lowest possible cost for transportation is the primary object and, as the equipment carried does not require a truck, the use of the standard light passenger cars is in the best interests of the Government. Passenger cars also have an added advantage in that it is often possible to carry other employees or cooperating State officials to the site of the work without the use of another vehicle.

It is not practicable for the Bureau to attempt to carry on economically and efficiently its varied activities in the field by the use of public transportation. When Government-owned cars are not available it is necessary to authorize employees to operate their personally-owned cars, for which they receive reimbursement at 5 cents a mile. The Bureau is now operating 594 passenger-carrying vehicles in the field and has found their use to be considerably less expensive than would be involved through reimbursement for the use of personally-owned vehicles. It has been found that in almost every section of the country Government-owned cars can be operated for approximately

3 cents a mile (purchase price, plus operation charges, less trade-in allowance). All the cars to be replaced are of such an age that they no longer can be operated economically, the average mileage being over 40,000, with some as high as 60,000. It has been the experience of the Bureau that the elements of age, mileage, and type of usage must all be taken into account when replacement of cars is considered, in order to reduce the expense of operating Government-owned vehicles. The funds requested in 1939 will permit the replacement of less than one-fourth of the Bureau's cars. Most of these vehicles are in use daily on rural inspectional work and many of them average 18,000 miles a year. It therefore appears necessary, if mileage costs are to be kept at the lowest point possible, to replace all vehicles, on an average, at least every four years.

BUREAU OF DAIRY INDUSTRY

(a) GENERAL ADMINISTRATIVE EXPENSES

Appropriation Act, 1938	$70,495
Budget Estimate, 1939	70,495

PROJECT STATEMENT

Project	1937	1938 (Estimated)	1939 (Estimated)
General administration and business service	$70,423	$70,495	$70,495
Unobligated balance	72	---	---
Total appropriation . .	70,495(a)	70,495	70,495

(a) For 1937 includes $2,500 transferred from "Dairy Investigations".

WORK UNDER THIS APPROPRIATION

The work conducted under this appropriation included the direction of research, regulatory, and service activities of the Bureau of Dairy Industry, the administration of the business activities, general supervision of personnel, administrative review of publications and other material for disseminating the results of research work, and compilation of bibliographies of dairy literature and related library work.

(b) DAIRY INVESTIGATIONS

Appropriation Act, 1938	$633,199
Budget Estimate, 1939	653,120
Increase	19,921

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Increase
1. Investigations of milk and butterfat production of dairy cows:				
(a) Investigations of inheritance of milk and butterfat production . .	$164,006	$165,632	$165,632	---
(b) Investigations of influence of feeding and management on level and cost of milk production and growth	68,771	68,036	68,036	---
(c) Investigations of relation of conformation to producing ability . .	13,578	13,951	13,951	---
(d) Investigations of the nutritional and other physiological factors affecting the usefulness of dairy cattle	79,568	78,853	78,853	---
(e) Studies of dairy-herd-improvement association records to determine the effect of the application of breeding and feeding practices on level and economy of production. .	88,736	88,750	108,671	+ $19,921 (1)
Total, Investigations of milk and butterfat production of dairy cows. .	414,659	415,222	435,143	+ 19,921 (1)
2. Market-milk investigations				
(a) Dairy sanitation research	10,774	11,978	11,978	---
(b) Milk-plant management investigations	7,183	7,986	7,986	---
(c) Milk quality improvement investigations . .	11,273	12,156	12,156	---
Total, Market-milk investigations	29,230	32,120	32,120	---

PROJECT STATEMENT --Continued

Projects	1937	1938 (Estimated)	1939 (Estimated)	Increase
3. Investigations of the utilization of milk in the manufacture of milk products:				
(a) Basic investigations of the bacteriology and chemistry of milk . . .	$17,231	$16,658	$16,658	---
(b) General investigations of ice cream manufacture	15,067	19,298	19,298	---
(c) General investigations of the manufacture of butter and byproducts .	28,027	49,218	49,218	---
(d) Condensed, evaporated and dried milk investigations	31,928	26,180	26,180	---
(e) General investigations of cheese manufacture .	34,877	37,472	37,472	---
(f) State and industry relations for milk products manufacture. .	24,045	30,031	30,031	---
(g) Inspection of renovated butter factories (regulatory)	5,832	7,000	7,000	---
Total, Investigations of utilization of milk in the manufacture of milk products	157,007	185,857	185,857	---
Total obligated	600,896	633,199	653,120	+$19,921
Unobligated balance . . .	25,703	---	---	---
Total appropriation .	626,599(a)	633,199	653,120	+ 19,921

(a) For 1937 excludes $2,500 transferred to "General Administrative Expenses".

INCREASE

(1) An increase of $19,921 to provide for a more effective study of dairy herd-improvement association records. The need for increased funds for this project is emphasized by the fact that while the work has been in progress only 15 months, records are being received at the rate of 1,000 a day with only about half the dairy herd-improvement associations reporting. When all of the associations begin reporting at least 1,700 records will be received daily. These records must be checked,

tabulated, analyzed, and published. The present personnel is inadequate for handling the volume of work. The purpose of this project is to identify all animals in the dairy herd-improvement association herds possessing the ability to transmit to their offspring an inheritance for high milk and butterfat production. Data are being obtained on every sire used in every association herd with the result that superior sires are being identified annually in large numbers. The utilization of these sires and the dissemination of their influence throughout the dairy-cow population will have a tremendous influence on the efficiency of the dairy cattle of the nation. There are in the United States 432,000 dairy herds of 11 cows or more. This project will provide information on a sufficient number of animals to supply these 432,000 herds with improved breeding stock. When the program is in full operation dairymen generally will have the opportunity for the first time to obtain the services of sires known to have the ability to transmit an inheritance for high milk and butterfat production. The producing efficiency of dairy herds generally may be consistently and systematically improved. Only good replacement stock will be produced which will greatly reduce the tremendous loss dairymen now suffer by raising poor replacements, which are discarded as soon as their inferiority is established. This project is conducted through a nationwide sire-proving program which has been adopted by all States and is being conducted in all dairy herd-improvement associations in the States.

WORK UNDER THIS APPROPRIATION

General.--The work conducted under this appropriation by the Bureau of Dairy Industry embraces scientific research and experimentation in the various problems of milk production and utilization, including studies in the breeding, feeding, and management of dairy cattle; nutritional and physiological factors affecting milk secretion and the health of animals with special reference to reproduction; investigations of the efficiency and economy of milk production through the operation of dairy-herd-improvement associations; studies of problems relating to the sanitary production, transportation, processing, and distribution of market milk and cream; basic investigations of the bacteriology and chemistry of milk; investigations of the effective utilization of milk byproducts to develop new uses for such byproducts; and studies of methods of manufacturing milk products and byproducts, including improvements in existing methods of manufacture. The Bureau is also charged with the enforcement of the law relating to the manufacture of renovated or process butter and the sanitary inspection of renovated-butter factories.

1. Investigations of Milk and Butterfat Production of Dairy Cows.--Under this project investigations are conducted in the breeding, feeding, and management of dairy cattle, including investigations of the nutritional and physiological factors affecting milk secretion and reproduction. The investigations are conducted by the Bureau of Dairy Industry through its Divisions of Dairy Cattle Breeding, Feeding, and Management; Dairy-Herd-Improvement Investigations; and Nutrition and Physiology under the following projects:

(a) Investigations of Inheritance of Milk and Butterfat Production.--These investigations have for their object a determination of the comparative effects of different methods of breeding in fixing an inheritance for high

and uniform levels of producing ability in dairy cows, and a test of the possibilities of breeding strains of cattle which will be pure for high levels of production by the continued use of sires that have demonstrated that they possess an inheritance for transmitting high levels of production. The need for investigational work in the breeding of animals for consistently high production is emphasized by the fact that of all cows in dairy-herd-improvement associations only about one-third of them produce enough to be profitable to their owners. The other two-thirds either show no profit at all or are being kept at a loss. Data from 25 States show that about 38.6 percent of the cows discarded were eliminated because of low production. Less than 2 percent of the total cow population of the country are in dairy-herd-improvement associations, and these, together with cows being tested through the breed associations, are considerably higher producers, on the average, than the average dairy cow.

A recent germ-plasm survey, the results of which were published in the 1936 Yearbook of the Department of Agriculture, showed that in approximately 1,100 herds representative of the better class of dairy cattle in the country, no improvement in producing ability, on the average, has been achieved. In 708 of these herds, 4,309 sires had been used, and of those sires on which sufficient data were available to evaluate their transmitting ability, only about one-half had been able to increase the production of their daughters over that of the dams of the daughters, though these sires had been selected by men who were perhaps the best informed in such matters in the industry. In 1935 the average production of all cows in the United States kept for milk purposes was about 4,000 pounds of 4 percent milk. The first 8 daughters of a sire in the herd of the Bureau of Dairy Industry at the Beltsville Experiment Station have an average yield as junior 2-year-olds of 14,413 pounds of milk and 553 pounds of butterfat, which, on a mature basis, is equivalent to 19,764 pounds of milk and 762 pounds of butterfat. Six more daughters will have completed their first lactation records by the middle of January 1938, and their records will not greatly affect the average of the first 8 daughters. While these cows were milked three times a day, an equivalent production on twice-a-day milking would be 11,530 pounds of milk and 443 pounds of butterfat as 2-year olds, and 15,811 pounds of milk and 610 pounds of butterfat on a mature basis. This is an indication of what it is possible to accomplish by breeding, though the point where such results can be uniformly attained has not yet been reached.

Dairy farmers will continue to carry the burden of a large percentage of cows that do not possess the inherent ability to produce a sufficient amount of milk and butterfat to make them profitable until such time as breeding experiments, such as those being conducted by the Department, point the way to breeding practices that will be free of the factors responsible for low production.

Artificial insemination as a means of expanding the use of valuable breeding sires is continuing to receive close study. A cow in the dairy herd at the Huntley, Montana, Dairy Experiment Station is due to freshen the latter part of February as a result of artificial insemination with semen shipped from the Beltsville, Maryland, Experiment Station by air mail.

(b) Investigations of Influence of Feeding and Management on Level and Cost of Milk Production and Growth.-- The object of this project is to determine the influence of various feedstuffs on the growth and milk production of dairy cows; the comparative values of various roughages when cut at different stages of maturity and when made into hay or silage; the effect of fertilization and rotational grazing on the value of pastures for milk production; and the effect of different methods of handling, milking, feeding, exercising, and pasturing on the economy and level of milk production. Artificial drying of roughages is being tried out experimentally. The determination of feeding methods and rations for calves to reduce mortality and assure growth during the early months of life is also an important phase of the work.

Data collected in these experiments show that nutrients for cows can be produced in perennial roughage crops at approximately half the cost of producing nutrients in grains. Twenty-three Holstein-Friesian cows on rations consisting entirely of alfalfa hay, corn silage, and pasture have completed 29 lactation periods with an average yield at maturity of 11,847 pounds of milk and 421 pounds of butterfat. Fifteen cows on rations consisting entirely of alfalfa hay have completed 24 lactation periods with an average yield of 11,125 pounds of milk and 390 pounds of butterfat on a mature basis. Four cows on rations consisting entirely of hay made from immature pasture grass herbage have completed five lactation periods with an average of 11,203 pounds of milk and 400 pounds of butterfat. Because of the lower cost of producing nutrients in the form of roughages the lower production of cows on rations consisting largely of roughage may be as profitable as the higher production secured by heavy grain feeding.

Experiments indicate that any kind of hay crop in the green form can be made into palatable silage with little loss of nutrients by partial wilting before ensiling (when necessary), fine chopping, and thorough packing in a tight silo. The addition of acids or molasses to preserve the silage is laborious, expensive, and unnecessary. Alfalfa silage is now being fed in comparison with alfalfa hay to determine the relative values of the two feeds. The application of the knowledge gained from this experiment should make it possible to avoid much of the loss that is entailed each year in curing hay under unfavorable weather conditions.

For the past two years silage corn at the Beltsville station has been put in silos constructed with a snow fence and lined with a paper which resists water and acid. The annual cost of these silos is estimated to be about 37 cents per ton of silage. The quality of silage has been excellent and the spoilage negligible. This construction makes a very economical and efficient silo for temporary use.

(c) Investigations of Relation of Conformation to Producing Ability are carried on for the purpose of determining the relationship, if any, between conformation and anatomy of dairy cows to their producing ability, and to establish, if possible, a scientific basis for judging and selecting dairy cattle from outward appearances.

It has been found that the first lactation production of a group of 64 Holsteins is closely related to the degree of development of secretory tissue in the udder as evaluated by palpation at six months of age. Average

production increased steadily by groups from 8,856 pounds of milk for animals that had a retarded development as calves to 14,317 pounds for animals that had an advanced development as calves. This finding gives promise of making it possible to identify calves that have a potential capacity for low production and thus to eliminate the heavy losses resulting from raising several million dairy heifers to producing age only to find they are unprofitable producers.

(d) Investigations of the Nutritional and Other Physiological Factors Affecting the Usefulness of Dairy Cattle.--The investigations being conducted under this project contemplate the determination of the essential elements of a ration that will maintain a cow in good health and optimum milk production. It is evident that in many cases the milk yield is limited and the nutritive value of the milk lowered by specific factors that are lacking in rations which by the usual standards would be considered ample, and that continued subsistence on rations deficient in some respect may result in temporary or permanent failure of the reproductive function or failure to resist infection, thus resulting in large economic losses.

The investigations under this project include among others (1) a critical study of the energy required in the rations of dairy cattle and of the methods of determining the energy value of cattle feeds; (2) the effect of different levels of protein in the diet of a cow upon the yield and composition of her milk, including a study of the metabolism of various protein constituents in relation to milk secretion; (3) the calcium and phosphorus metabolism of dairy cattle, including a study of the effect on growth, health, production, and reproduction of using mineral supplements and roughages of various kinds and quality; (4) an investigation of vitamin A in the nutrition of dairy cattle, including a study of the reproduction of the cow on low-quality hays, the amounts of vitamin A required in dairy rations for growth and for normal reproduction, the effect of various levels of vitamin A in the diet upon the nutritive value of the milk, the rearing of calves on milks that are low in vitamin A content and on skim milk, the vitamin value of various farm feeds, and methods of supplementing vitamin-A-deficient feeds for growth, for reproduction, and in order to produce milk rich in this nutritive essential; (5) a study of the effect of partially deficient rations on fecundity in cattle and small animals, in succeeding generations, in order to get at the nature of some of the dietary factors causing irregularities or complete failure in reproduction with dairy cattle; (6) investigation into the changes in milk coincident with the onset of mastitis and the factors causing these changes.

Investigations on the physiology of milk secretion, including a study of the relation between the diet, the composition of the blood, and the composition and secretion of milk, together with a study of the endocrine factors affecting milk secretion, are also conducted under this project.

(e) Studies of Dairy-Herd-Improvement Association Records to Determine the Effect of the Application of Breeding and Feeding Practices on Level and Economy of Production.--There are more than 1,000 dairy-herd-improvement associations operating in the 48 States, Puerto Rico, and Hawaii testing more than 500,000 cows in approximately 23,000 dairy herds. In 1936 these cows produced an average of 319 pounds of butterfat. There are in the United States approximately 25,000,000 cows kept for milking purposes. The

latest available data show that these cows have an average butterfat production of only 164 pounds per year, or approximately one-half that of the cows on test in dairy-herd-improvement associations. It is the purpose of this project to determine the most efficient and profitable dairy-herd and dairy-farm-management practices followed in dairy-herd-improvement associations, in order that those practices may be recommended for adoption by dairymen generally.

Feed and production records obtained in all herds on test in dairy-herd-improvement associations are analyzed to show, under actual farm conditions, the most efficient and profitable feeding and herd-management practices. Production, value of product, feed cost, and income over feed cost are calculated for each cow on test. With this detailed information the dairyman may intelligently discard low-producing, unprofitable cows from his herd and adopt better feeding practices. The feed and production records are summarized and analyzed by herds, by associations, by States, and for the United States. These analyses are made available to the State colleges to be used by them in connection with their campaigns to promote the adoption of improved practices.

Improving dairy herds through culling, feeding, and management has definite limitations, as a herd cannot be made to produce more than its inherited or natural capacity to produce. Genuine herd improvement, therefore, must come through breeding. Dairymen generally, however, are having discouraging and costly experiences in improving the breeding of their dairy herds. A dairyman may be successful in selecting a bull that will improve his herd, but experience shows that two times out of three he will select a sire that will lower the average production of his herd.

To cope with this situation and to assist dairymen in selecting bulls that should improve their herds, the production records obtained in dairy-herd-improvement associations are being used as the basis of a nationwide sire-proving program, more comprehensive in scope than any dairy cattle breeding program ever conducted in this or in any other country. In a sense, the 500,000 cows on test serve as a breeding herd to supply improved breeding stock for our national dairy herd of 25,000,000 cows. To accomplish this task breeding stock, particularly sires, must be made available in great numbers. To place this far-reaching program into operation it is necessary to identify all animals on test. Approximately 80 percent of the animals in association herds are grades and in the past have not been satisfactorily identified. A nationwide eartag identification plan was developed through which every grade or nonregistered animal is given a special eartag number. With complete identification records of grade as well as purebred animals, blood and family lines may be traced and evaluated in all herds in dairy-herd-improvement associations. Complete identification and production data for all the 500,000 cows in association herds are assembled in a permanent record system established in the Bureau of Dairy Industry. The records are filed so as to show every dairy cow family represented in the 23,000 association herds. The data are used to indicate the breeding value of every sire used in every association herd. As the work progresses from year to year, proved sires and the sons of proved sires, by the thousands, will be located and made available. There are approximately 1,500 counties in the United States that may

be regarded as dairy counties. Eventually it will be possible to have in each county and community several sires on which data are available to indicate their breeding value. When this situation prevails the demand for improved breeding stock may be satisfactorily supplied.

To disseminate all available information on dairy sires, a proved-sire record for each sire is issued to the owner and to dairy leaders in the States. The genetic make-up of sires is indicated so that inferior ones may be discarded while superior ones may be retained for more extensive use. Complete genetic analyses are made of association herds to indicate those animals and families of dairy cattle that seem to possess the ability to transmit to their offspring an inheritance for high-producing capacity. The influence of the superior animals and families may then be perpetuated and disseminated throughout the dairy-cow population. At six-month intervals the records of all proved sires are published for general distribution in order that information on proved dairy sires may be available to dairymen and dairy leaders generally. A bull association program is sponsored and directed by the Bureau of Dairy Industry to demonstrate the advantages of an organized dairy cattle-breeding program for a community and the economy of cooperative ownership of herd sires. Bull associations provide the facilities for long and extensive use of good proved sires.

Often a dairyman loses money on his farm business as a whole even though he has a high producing herd. In such cases financial records to supplement the feed and production records will show the weak and strong points in the organization and operation of the farm. It may be that the income from the dairy herd is being wasted by uneconomical feeding and care, paying extravagant prices for new stock and having only cull stock to sell, inefficient crop production methods, high expenses for buildings and equipment, etc. Recognizing that efficiency in farm organization and operation is necessary to obtain the greatest net farm income, complete financial records are now being obtained on many farms in dairy-herd-improvement associations. This phase of the project is conducted in cooperation with the Bureau of Agricultural Economics and the analysis of the records obtained will be done under the direct supervision of the Farm Management Division of that Bureau. The results of the analyses of farm management and dairy production data will be returned to the State colleges for use in promoting more profitable practices.

2. Market-Milk Investigations.--Under this project are conducted investigations in sanitary and economical methods of producing, transporting, processing, and distributing market milk and cream to be utilized in fluid form. These investigations include the production and handling of market milk under experimental as well as practical conditions on dairy farms and a study of community milk improvement through milk-control and extension agencies on the area plan. Investigations of the construction, equipment, and efficient operation of milk plants for the processing and preparation for the market of fluid milk and cream are also conducted, as are investigations in the laboratory and at commercial dairy farms and plants to ascertain factors affecting the marketability of milk and cream.

The purposes of the work being conducted are to prevent losses due to souring, spoilage, and other causes; to increase the market value of milk to the farmer, increase consumption of milk, and make rural and urban milk supplies more safe; to effect economies in initial investments and operating costs of milk plants so as to reduce the spread between producers' and consumers' prices through greater efficiency in plant operation; and to discover undesirable practices which impair the market qualities of milk and cream and devise remedial measures.

The results of these researches enable dairymen to reduce losses through rejected and low-quality milk; extend markets over greater areas; lessen the "spread" between producer and consumer by the introduction of more efficient methods; and increase consumption because of a more acceptable product.

3. Investigations of the Utilization of Milk in the Manufacture of Milk Products.--Nearly one-half of the milk produced in the United States is used in making manufactured products. While the consumption of fluid milk is relatively high, the per-capita consumption of manufactured milk products is much lower than in most other dairy countries. This is due in some measure to the inferior quality of much of the domestic product, and this in turn is due to a lack of understanding of the fundamental principles involved and the absence of scientific control of manufacturing methods. Even under good conditions there are losses from abnormal bacterial fermentations and faulty technique.

In addition to the primary products made from milk, enormous quantities of byproducts (skim milk, buttermilk, and whey) are produced. Although the cost of producing the milk solids in these byproducts is nearly as great as the cost of producing the milk fat, adequate methods of converting the solids of these byproducts into human food have been devised to only a limited extent. The object of this project is, therefore, to discover the basic principles involved in handling milk and manufacturing it into various products and by the application of these principles to improve the quality and reduce the cost of manufacture; and to develop the domestic manufacture of certain dairy products now imported from foreign countries and establish these methods in the industry. The work is conducted under the following projects:

(a) Basic Investigations of the Bacteriology and Chemistry of Milk.--The manufacture of all dairy products is based on the control of bacteriological and chemical changes in milk, and the results of studies of these changes provide the basis for all laboratory investigations of an applied nature. Therefore, work on the bacteriology and chemistry of milk is fundamental to practically all investigational work dealing with the manufacture of milk products. The investigations of the Bureau of Dairy Industry have included such work as taxonomic studies of the colon-aerogenes group, the lactobacilli, the bacteria producing alkaline reaction in milk and the proteolytic bacteria of milk, the determination of the hydrogen ion and its relation to the growth of bacteria, and studies of the chemical and physical structure of milk. Such studies have frequently led to unforeseen results of great value.

The possibilities of light as a means of controlling reactions, not only of a purely chemical nature but of life processes as well, are just beginning to be realized. In recognition of this fact, work is in progress which will yield important information concerning the action of different kinds of light upon bacteria.

The physico-chemical changes brought about in milk due to bovine mastitis and the improvement in the methods used in detecting the disease are important when it is considered that from 40 to 60 percent of the milking cows of this country are affected with this disease in one form or another. Investigations have been made to determine the normal sequence of the changes occurring in the milk before and after the onset of the disease and the effect of this abnormal milk when used in the manufacture of cheese.

The identity of the combinations and forms in which many of the chemical constituents of milk exist and the changes which take place in these constituents during manufacturing processes have never been definitely established. Progress in this direction will be of great value in controlling manufacturing processes. Fundamental investigations of these problems are under way.

(b) General Investigations of Ice Cream Manufacture.--Ice-cream making has been developed almost entirely by empirical methods, with little understanding of the physical and chemical principles involved. The rapid development of the industry from small plants operating a single freezer to great factories supplying large districts has introduced many problems in collecting and storing raw materials and the production of a uniform product. The purpose of these investigations, in addition to solving manufacturing difficulties, is to develop methods of manufacture whereby the quantity of milk solids may be increased and the quality of the product improved.

A method has been developed for producing a concentrated skim milk low in lactose which will permit of the utilization of more milk solids-not-fat in ice cream through the use of concentrated skim milk, skim milk powder, and other by-products. Another method for producing milk solids low in both milk salts and lactose is being developed.

There are over one hundred factors incident to normal ice-cream manufacture that will influence the whipping capacity of ice-cream mixes. The development of an accurate method for measuring whipping properties of ice-cream mixes is now making it possible to study these factors in detail for the first time.

(c) General Investigations of the Manufacture of Butter and Byproducts.--In the manufacture of butter and cheese over 2,500,000,000 pounds of milk solids are produced annually in the form of skim milk, buttermilk, and whey. While only a relatively small part of this is actually wasted, yet from the standpoint of its high food value the most of it is utilized very inefficiently. The more effective utilization of this material by creating new products and improving the quality of the old ones are other phases of the research work being conducted. For example, methods of making casein, used extensively in adhesives and in coating paper, have been perfected and standardized until it is now possible to make a uniform grade especially suited to these purposes. The causes of "foaming", one of the serious defects in making paper-coating solutions, have been determined and remedied.

Methods for the separation of lactalbumin (the soluble protein of milk) from the whey have been developed. The whey, obtained as a byproduct in the manufacture of cheese and casein, contains large quantities of lactose of milk sugar for which there is now only a limited market.

An entirely new method of separating both the sugar and the proteins is now in the laboratory stage and the commercial application is being developed. A method of converting the sugar in the whey into lactic acid is now in operation on an extensive scale, and investigations into means of converting this acid to resins, lacquers, and other industrial products are yielding promising results.

A process for making a textile fiber resembling wool from skim milk is through the laboratory stage and ready for trial under factory conditions.

Various uses have been found for concentrated whey in soups, confectionery, and other foods and a process perfected by which whey can be concentrated and preserved by the smaller factories.

(d) Condensed, Evaporated, and Dried Milk Investigations.--Three methods for the preservation of milk have been successfully developed commercially. These are the evaporation of milk under vacuum with the addition of sufficient cane sugar to preserve it (condensed milk); evaporation under a vacuum and heat sterilization in the final container (evaporated milk); and reduction to dryness (dried milk). The first method changes the composition of the milk and is falling into disuse. The application of the second is limited because the sterilization gives the milk a slightly cooked flavor which makes it less desirable than fresh milk. The powder obtained by the third method soon acquires an off-flavor through oxidation. If it were possible to prepare a concentrated milk which would keep indefinitely and, on restoration to its original volume, have the flavor and nutritive value of fresh milk, the problem of distribution would be greatly simplified and consumption increased. If the bacterial spores which make necessary the high heat required for sterilization could be made more sensitive to heat, the sterilization temperature of evaporated milk could be materially lowered with a consequent disappearance of the cooked flavor of this product. Other possibilities of improving the flavor of evaporated milk are also investigated.

(e) General Investigations of Cheese Manufacture.--The United States imports over 60,000,000 pounds of cheese annually. To make this quantity of cheese requires the milk from 150,000 average cows. This imported cheese is nearly all of those varieties which command relatively high prices and consequently yield greater returns to the producers of the milk than the ordinary Cheddar cheese.

While the quantity of cheese manufactured in this country is greater than in any other single country, the per capita consumption is lower than in most of the other dairy countries, due partly to the low quality of a part of the domestic cheese and in some measure to the unattractive packages in which it is marketed. If this country's per capita consumption of cheese were on a par with that of most European countries, the number of dairy cows would have to be at least doubled in order to supply the necessary amount of milk.

Investigations being conducted by the Bureau of Dairy Industry have for their object the determination of the biological and chemical factors involved in the production of the characteristic flavors and physical properties of various foreign and domestic varieties of cheese. They have for their purpose the improvement of the quality of domestic cheese to provide an additional market for milk.

The manufacture of Swiss and Cheddar cheese from pasteurized milk presents difficulties in developing texture and flavor. These problems are being studied with a view to making pasteurization universal. Work has also been started on some of the milder-flavored, quick-ripening French and Italian cheeses. The ultimate aim of these investigations is to improve the quality of cheese through better milk control, culture control, the standardizing of manufacturing procedures, and careful regulation of the curing conditions, so that the manufacture of all varieties of cheese may be placed upon a more scientific basis. Progress is being made in the direction of modernizing the packaging of cheese.

(f) State and Industry Relations for Milk Products Manufacture.--In the research work of the laboratories of the Bureau facts are established which modify existing methods of dairy manufacturing, new processes are established, new products developed, and improved methods of applying scientific control to factory practices worked out. While this new information is published in one form or another, much of it has only potential value until factory operators are convinced by demonstration of its practicability.

Projects on which the Bureau is now working in cooperation with State organizations include the laboratory control of Swiss cheese manufacture, introduction of the making of cheese of the French Roquefort type and the Italian Bel Paese, the packaging of Cheddar cheese in cans, the manufacture of lactic acid by the fermentation of whey, and the shipment of frozen concentrated milk to subtropical countries.

Mobile laboratories, recently installed in the Swiss cheese field work, have demonstrated their value by furnishing definite information on the control which factories must exercise on the milk supply if first-grade cheeses are to be obtained.

(g) Inspection of Renovated Butter Factories(Regulatory).--The administration of regulatory acts relating to sanitary condition of process or renovated butter factories, the inspection of material and ingredients entering into the manufacture of the finished product, the approval of brands and labels used, and the inspection and certification of process or renovated butter intended for export are functions of the Bureau of Dairy Industry conducted under this project. The investigation of the fraudulent manufacture or labeling of this product is also conducted in cooperation with the Bureau of Internal Revenue of the Treasury Department.

BUREAU OF PLANT INDUSTRY

(a) SALARIES AND EXPENSES - PREAMBLE

Change in Language

The preamble to "Salaries and Expenses" has been amended so as to make it conform to the more generally accepted phraseology used elsewhere in the Appropriation Act, and in order to more appropriately represent the work being done hereunder.

(b) GENERAL ADMINISTRATIVE EXPENSES

Appropriation Act, 1938 . . . . . $189,242
Budget Estimate, 1939 189,242

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
General administration and business service.....	$186,991	$189,242	$189,242
Unobligated balance.....	2,251	- - -	- - -
Total appropriation.....	189,242	189,242	189,242

WORK UNDER THIS APPROPRIATION

The direction of the research, service, and regulatory work of the Bureau of Plant Industry, administration of fiscal affairs, general supervision of personnel, and administrative review and preparation of research and other publications and bibliographical and related work are carried on under this appropriation.

(c) ARLINGTON FARM

Appropriation Act, 1938 . . . .$49,414
Budget Estimate, 1939. 49,414

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
Arlington Farm--maintenance of facilities for basic plant research..	$49,085	$49,414	$49,414
Unobligated balance.....	329	- - -	- - -
Total appropriation.....	49,414	49,414	49,414

WORK UNDER THIS APPROPRIATION

A highly improved 400-acre tract is maintained in Virginia, near Washington, D. C., provided with specially equipped laboratories, greenhouses, barns, shops, and other buildings to furnish facilities for conducting experiments and practical farm tests covering a wide range of research work, national in scope, principally for the Bureau of Plant Industry, but also available for the Bureaus of Chemistry and Soils, Public Roads, Entomology and Plant Quarantine, and Agricultural Engineering, the Soil Conservation Service, and other branches. By furnishing similar facilities common to the many activities from a central station, duplication of effort and equipment is avoided and the cost of operation appreciably reduced. This item provides funds for the general maintenance of the plant and farm facilities. The work of other divisions in the Bureau and of other bureaus and departments is conducted at cost on a reimbursement basis.

(d) BOTANY

Appropriation Act, 1938	$76,635
Budget Estimate, 1939	76,635

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
1. Botanical investigations.....	$36,389	$36,635	$36,635
2. Weed control investigations.....	38,174	40,000	40,000
Unobligated balance.....	2,072	- - -	- - -
Total appropriation.....	76,635	76,635	76,635

WORK UNDER THIS APPROPRIATION

General.--Research under this appropriation consists of the identification of wild and cultivated plants; special systematic studies of grasses that serve as a basis for forage, range, and erosion-plant collection work; the domestication and improvement of wild plants, particularly the blueberry; and weed control investigations. Botanical studies conducted under this project serve as a starting point for numerous investigations made by the various branches of the Bureau of Plant Industry and other bureaus of the Department. With the increased demands made upon this project by the Forest Service and the erosion-control agencies and the inevitable increase of duties resulting from the development of the National Arboretum, work under this project has become of major importance. The studies and identifications under this project are essential to the development of accurate and dependable plans for future work.

The work in weed control is to determine the most effective and economical methods of controlling or eradicating field bindweed, or European morning glory, and other noxious weeds. Control methods studied include tillage and cultural practices, crop rotations, and the use of chemicals. Field and laboratory experiments are being conducted in seven western states in cooperation with the State agricultural experiment stations. The justification for these investigations lies in the very wide and rapid dissemination of bindweed in past years and the very great difficulty and enormous expense encountered by farmers in eradicating it. Farms otherwise productive have been abandoned because of bindweed infestation, and in several States the pest is considered so serious that loans can not be secured on infested farms. It is very difficult to eradicate bindweed entirely once it becomes firmly established. It is believed that research with chemical treatments and with cultivating and cropping methods this project will indicate feasible and economical methods of control.

1. Botanical Investigations.--Work on economic botany consists chiefly of studies and identifications of plants other than grasses for various bureaus of the Department. Assistance is also given to agricultural experiment stations, farmers, nurserymen, and other individuals and organizations. Information derived from this work is of primary importance in grazing and erosion work, investigations of plants poisonous to stock, forage experiments, and other lines of work. Correct botanical identification is of primary importance for all breeding projects involving cultivated plants and their wild relatives. Accurate and dependable studies and identifications are essential as a basis for investigations if reliable results are to be obtained.

Work on grass investigations includes systematic studies of both domestic and foreign grasses which serve as a basis for important grass investigations from the forage and erosion standpoint. The collection of grass specimens maintained is the largest and most valuable reference collection in the world. The botanical studies conducted and publications built up as a result of these studies comprise a reference collection of information which is the basis of all important grass investigations of the Department. With the increased importance of forage and soil-erosion projects, this work has become an important factor in the conduct of the investigations. Adequate and accurate reference is essential as a starting point for our grass projects.

The principal work on blueberry investigations has been the breeding of new varieties of blueberries earlier and later than those now in use, or of still better flavor and other desirable commercial qualities, or adapted to a latitude and climate farther south than existing varieties. The wide interest in blueberry culture has developed a rather extensive correspondence on the subject. The blueberry investigations have resulted in the domestication and improvement of the wild blueberry; in the addition of a luscious and healthful fruit to the dietary of city dwellers; in the establishment of a thriving and growing new industry of blueberry culture; and in the utilization of areas of special, strongly acid soils not adapted to other agricultural uses.

A similar project is conducted in breeding American varieties of gooseberries, using native species in themselves suited to our conditions but now of inferior quality.

2. Weed Control Investigations.--Recent investigations indicate that certain crops such as winter rye, alfalfa, and soybeans compete with bindweed more successfully than do corn, spring grain, potatoes and sugar beets. Experiments on the frequency of cultivating to destroy bindweed show that the number of cultivations usually recommended can be lowered materially if cultivation is delayed each time until the new growth has exhausted a larger portion of the reserve food material left in the roots. These and other investigations should result in the development of practices that will permit the eradication of weeds at a greatly reduced expense.

(e) CEREAL CROPS AND DISEASES

Appropriation Act, 1938	$541,721
Budget Estimate, 1939	532,371
Decrease	9,350

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Decrease
1. Barley investigations.....	$55,308	$55,855	$55,855	- - -
2. Corn investigations.....	135,441	136,505	130,305	- $6,200 (1)
3. Seed flax investigations...	14,916	15,145	15,145	- - -
4. Sorghum investigations.....	25,905	26,098	26,098	- - -
5. Oat investigations.....	43,381	43,875	43,875	- - -
6. Rice investigations.....	43,790	44,155	44,155	- - -
7. Wheat investigations.....	197,503	220,088	216,938	- 3,150 (2)
Unobligated balance.....	4,477	- - -	- - -	- - -
Total appropriation.....	520,721	541,721	532,371	- 9,350

DECREASE

There is a decrease of $9,350 in this item for 1939, consisting of (1) $6,200 for "Corn investigations" and (2) $3,150 for "Wheat investigations". The reduction will be met by curtailment of work under these projects.

WORK UNDER THIS APPROPRIATION

General.--Research work conducted under this appropriation includes experiments with cultural methods for cereal crops and the development of new and improved methods; comparison of the yield and adaptation of different varieties to different regions and of their quality for different uses, together with the breeding and selection of improved and better-adapted

varieties; and the development of methods of controlling the diseases of all cereal crops, including the breeding of disease-resistant varieties. Cooperative experiments are carried on at most of the State agricultural experiment stations but no independent field stations are maintained.

The justification for this work lies in the importance of the cereal crops to the agriculture of the United States and in the many difficult problems confronting their successful production. Cereal crops not only supply directly an important part of the dietary requirements of the people, but as feed for livestock are the basis of our livestock and dairy industries as well. Cereal crops occupy about 225,000,000 acres each year. Corn, the principal cereal crop, is the most important single crop of the country, being grown on about 100,000,000 acres. It is the backbone of American agriculture. Increased efficiency and reduced costs are necessary for the profitable production of cereal crops and the consequent well-being of our agricultural population. Increased efficiency and reduced costs can be attained through improvement in practices and varieties which will reduce the hazards incident to disease, reduced fertility, and, insofar as possible, the action of cold and drought. Without the improved varieties even now available, the results of the disastrous drought during recent years would have been even more marked. Each of the cereal crops is attacked by 4 to 10 important diseases that could be controlled if resistant varieties or suitable treatments were developed.

1. Barley Investigations.--During recent years barley has been grown on approximately 12,000,000 acres annually. It is an important feed grain, and more than 60,000,000 bushels were used in the malt and liquor industries in 1936. Malting quality is a most important factor in determining price, high quality carrying a substantial market premium. The control of diseases and the improvement of varieties to insure quality is imperative in order to meet market needs and to insure profitable production.

2. Corn Investigations.--Corn is the most important single crop grown in this country and is the foundation of much of the American livestock industry. It normally occupies approximately 100,000,000 acres annually. Higher-yielding strains are needed to reduce production costs and to eliminate preventable hazards. Disease and insect resistant strains are needed to avoid crop losses and commercial damage. Disease control also is badly needed to prevent losses in growing and marketing corn.

3. Seed Flax Investigations (also Buckwheat).--Seed flax production is not extensive but in the areas where the crop is grown it is an important source of cash income. Flax is grown on more than 2,000,000 acres annually but the quantity produced is much less than domestic consumption. There is an opportunity for a profitable increase in the present acreage. The production of this crop is largely dependent on disease-resistant varieties, but in developing such varieties the yield and quality of oil have not been given sufficient attention. There is a definite need for improved varieties combining disease resistance with seed yield, oil yield, and oil quality.

4. Sorghum Investigations (also Broomcorn, Proso Millets, etc.).--Sorghums are grown on about 10,000,000 acres annually. They supply most of the grain and forage in the south-central United States, where drought and heat resistant summer crops are essential. Several improved varieties have been developed, but more dependable grain types are needed in the less favored sections and varieties of feeding quality are desired in other areas. Disease and insect resistance to reduce preventable losses are also needed. Broomcorn varieties producing better quality brush and less affected in quality by weather conditions are also badly needed.

5. Oat Investigations.--Oats are the most important small grain feed crop of the country. Their greatest value lies in their use in crop rotations, usually following corn, and in furnishing a nurse crop for seeding clover and grasses. About 40,000,000 acres of oats are grown annually. The quality of the crop is often seriously reduced by heat and drought and by diseases. While progress has been made in developing better varieties much remains to be done in breeding to reduce losses from weather and disease hazards that increase the costs of grain production.

6. Rice Investigations.--Rice is a specialized crop grown on a limited acreage so far as the country as a whole is concerned (750,000 to 950,000 acres annually), but in the localities where it is grown in Arkansas, Louisiana, Texas, and California it is a leading cash crop, yielding large acre returns. Lands used for rice are now well suited for other crops. The peculiar conditions under which the crop is grown, requiring constant flooding of the land, introduce many distinct problems in soil fertility, rotation, pests, diseases, and culture that require solution. Varieties of better culinary value, also, are needed to increase market demands. Methods of handling rice to develop a high milling quality are equally important.

7. Wheat Investigations (also Emmer, Spelt, etc., and Rye).--Wheat is the staple food crop of the country, is the leading crop in large and important areas, supports an extensive manufacturing and processing industry, and has been a most important export product. Profits in wheat production are dependent on reducing hazards from cold, drought, disease, and poorly adapted varieties and on the development of cultural and rotation practices that will reduce expense and at the same time stabilize production. Much has been accomplished along these lines, but much still remains to be done to obtain desirable types for all areas.

(f) COTTON AND OTHER FIBER CROPS AND DISEASES

Appropriation Act, 1938	$406,435
Budget Estimate, 1939	399,385
Decrease.	7,050

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Decrease
1. Cotton investigations (production, improvement, and diseases):				
(a) General cotton breeding and improvement investigations	$101,200	$103,945	$101,020	- $2,925(1)
(b) Egyptian cotton breeding and improvement investigations.....	21,916	22,253	22,178	- 75(1)
(c) Sea Island cotton breeding and improvement investigations.....	14,890	15,000	14,700	- 300(1)
(d) Cotton genetic investigations.....	52,100	54,000	53,800	- 200(1)
(e) Studies of the structure and growth of the cotton plant and of cotton fibers	9,080	9,300	9,300	- - -
(f) Cotton plant nutrition and other physiological investigations.....	64,050	66,000	64,500	- 1,500(1)
(g) Cotton disease investigations.....	27,970	28,000	28,000	- - -
(h) Cotton quality research, from the standpoint of production.....	39,130	40,000	38,400	- 1,600(1)
(i) Cotton culture investigations.....	9,090	9,200	9,200	- - -
(j) Investigations on establishing improved cotton seed stocks, including one-variety community methods.....	39,260	40,000	40,000	- - -
Total, Cotton investigations (production, improvement and diseases).....	378,686	387,698	381,098	- 6,600(1)

PROJECT STATEMENT - Continued.

Projects	1937	1938 (Estimated)	1939 (Estimated)	Decrease
2. Fiber plants other than cotton, investigations of:				
(a) Hard fiber studies.....	$7,958	$8,200	$8,050	- $150(2)
(b) Fiber flax agronomic and breeding investigations....	4,690	4,800	4,650	- 150(2)
(c) Hemp investigations.....	5,587	5,737	5,587	- 150(2)
Total, Fiber plants other than cotton.....	18,235	18,737	18,287	- 450(2)
Unobligated balance.....	9,514	- - -	- - -	- - -
Total appropriation.....	406,435	406,435	399,385	- 7,050

DECREASE

There is a decrease of $7,050 in this item for 1939, consisting of (1) $6,600 for "Cotton investigations" and (2) $450 for "Fiber plants other than cotton." The reduction will be met by curtailment of work under these projects.

CHANGE IN LANGUAGE

The proviso at the end of this item authorizing the acquisition of land in connection with the cotton field station near Greenville, Texas, has been omitted, in the estimates for 1939, since this transaction will be completed during the fiscal year 1938.

WORK UNDER THIS APPROPRIATION

General.--The work done under this appropriation consists of the investigation of cultural practices for growing cotton; the breeding of superior varieties of cotton, including Egyptian and Sea Island; study of the effect of soil, climate, and other factors on the yield, quality, and values of cotton fiber; study of chemical, physical, and other properties of cotton fibers which determine values for specified uses, and the measurement of probable values by means of these properties; investigation of cotton diseases and their control, including breeding for disease resistance; utilization and maintenance of superior strains of cotton through the organization of single-variety communities; and investigations of hemp and flax fiber production and of hard fibers and other fibers used for ropes, twines, etc. This work is conducted in cooperation with the Bureaus of Agricultural Economics, Agricultural Engineering, Entomology and Plant Quarantine, and Chemistry and Soils, with the State agricultural experiment stations and extension services, and with certain counties and group organizations.

1. Cotton Investigations (Production, Improvement, and Diseases).--This work consists of breeding operations to develop strains and types of cotton superior in yield and in lint character and resistant to climatic and other factors reducing yield and quality. It also includes studies of the relation of climatic and other factors to fiber yield and quality and of means for measuring quality factors so that new cottons being developed may be tested for quality before distribution. It likewise includes studies on cotton diseases and their control and of all other factors having to do with growing satisfactory yields of high-quality cotton.

Cotton is the bread-and-butter cash crop of the entire cotton-producing area. The crop also is of primary importance in domestic commerce and manufacture, six million 500-pound bales (in round numbers) being the normal domestic consumption, and is the country's principal agricultural export product. The 1937 crop occupies about 34,000,000 acres and in the past has totaled in excess of 40,000,000 acres. The 1936 cotton crop, including the value of the lint and seed, was worth in excess of $950,000,000. Intensive research on cotton is justified by its importance in the livelihood of such a large part of our population; by the necessity for improving and maintaining the improvement of American cotton in order to hold the export market in the face of the aggressive competition from high-quality foreign production; and by the necessity for stabilizing production and for reducing production costs through removal of hazards caused by low quality, poor-producing strains, diseases, faulty cultural practices, etc.

2. Fiber Plants Other Than Cotton.--Work under this project includes the investigation of hemp and flax fiber production in the United States and of hard fibers such as abaca (Manila hemp), maguey, sisal, and henequen in the tropics; and all plant fibers, except cotton, used for ropes, twines, yarns, woven fabrics, hats, matting, and stuffing or filling.

Flax fiber production is now established as a profitable crop in Oregon, and recent experiments of the Department indicate that this industry may be revived in certain areas in the East. The marked increase in the hemp acreage in this country in recent years shows increased interest in this crop. There is need for continued plant breeding of both fiber flax and hemp and further experimental work with relation to soil types and agronomic practices in growing these crops and preparing the fibers. Hard fibers, produced only in the tropics, are necessary for bindertwine and all high-grade cordage. It is important that coordination be continued between twine and cordage manufacturers in this country and fiber producers in the tropics and that standards of fiber quality be maintained.

(g) DRUG AND RELATED PLANTS

Appropriation Act, 1938. . . . . $47,139
Budget Estimate, 1939 47,139

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
1. Drug, poisonous, insecticide, oil, and related plant investigations.....	$34,684	$36,279	$36,279
2. Hop production and disease investigations.....	11,075	10,860	10,860
Unobligated balance.....	1,380	- - -	- - -
Total appropriation.....	47,139	47,139	47,139

WORK UNDER THIS APPROPRIATION

General.--The work under this appropriation consists of investigations of plants yielding drugs, poisons, insecticides, tanning materials, essential oils, drying oils, and perfumes with respect to their culture, their constituents, and their possibilities as crops in the United States; also studies on hop production with particular reference to the improvement of the quality of domestic hops and to the control of diseases, particularly the downy mildew, through field practices and the development of the new resistant varieties.

1. Drug, Poisonous, Insecticide, Oil, and Related Plant Investigations.--Plants that are important sources of products used in the manufacture of medicines, pharmaceuticals, flavoring materials, perfumes, insecticides, paints and varnishes, and related commodities are grown experimentally to determine their cultural requirements, the proper methods of handling, the methods of obtaining the commercial products from them, their qualities under various conditions, the possibilities of their improvement through selection and other means, and the cost of production as a basis for their introduction into American agriculture.

This country is dependent upon foreign countries for most of these products. In some cases such sources are not available during extensive world disturbances. Their domestic production insures a more steady supply and better quality for the consuming industries, and the growing of the plants producing them provides noncompetitive cash crops for farmers to turn to in favorable localities during periods of staple crop surpluses. In view of the fact that farmers are entirely unacquainted with the special requirements of such plants, much information must be obtained by preliminary investigations to provide the necessary background for their commercial introduction. This is primarily the objective of this project.

2. Hop Production and Disease Investigations.--Under this project hop growers are assisted along two lines: (a) The relationship of various production factors to the brewing qualities of hops are studied as a means of bringing about a general improvement in the quality and uniformity of domestic hops, and (b) growers are advised regarding cultural practices that reduce the spread of downy mildew and other diseases and instructed in the use of fungicide sprays and dusts to control the losses while a more permanent solution is sought through the development of new varieties with good commercial qualities and resistant to the disease.

The brewing industry is dependent almost entirely on the Pacific Coast States for its supply of domestic hops. Unless the downy mildew is effectively controlled or resistant varieties provided, hop growing may have to be abandoned in many localities where it is now an important industry. Aside from the economic loss suffered by the established growers, the resultant shortage would necessitate more extensive use of the more expensive foreign hops, with a corresponding increase in the cost of brewing.

(h) DRY-LAND AGRICULTURE

Appropriation Act, 1938.	$215,578
Third Deficiency Act, 1937 (available in 1938 for purchase of land, construction of dam and reservoir, etc., at the U. S. Southern Great Plains Field Station, Woodward, Oklahoma)..	76,000
Total available, 1938.	291,578
Budget Estimate, 1939	226,828
Decrease	64,750

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Decrease
Dry-land agriculture investigations:				
(a) Dry-land field crop production investigations.....	$162,200	$163,612	$159,862	- $3,750(1)
(b) Dry-land fruit and vegetable production investigations..	28,115	28,277	28,277	- - -
(c) Cooperative shelterbelt demonstrations and experimental test plantings.....	23,842	23,689	23,689	- - -
(d) Regrassing investigations in dry-land areas.....	- - -	76,000	15,000	- 61,000(2)
Unobligated balance.....	1,421	- - -	- - -	- - -
Total appropriation.....	215,578	291,578	226,828	- 64,750

DECREASE

The decrease of $64,750 in this item for 1939 consists of:

(1) A reduction of $3,750 in the allotment for "Dry-land field crop production investigations", which will be met by curtailment of work under this project.

(2) A reduction of $61,000 in the allotment for "Regrassing investigations in dry-land areas", including:

(a) A decrease of $76,000 due to the dropping of a nonrecurring item provided by the Third Deficiency Act, 1937, for the purchase of land, construction of dam and reservoir, and other necessary expenses for regrassing and the improvement and the development of grasses and other forage plants suitable for use at the United States Southern Great Plains Field Station, Woodward, Oklahoma.

(b) An increase of $15,000 for the maintenance of facilities and the operation of regrassing and grazing experiments, to determine the most efficient and economic methods for regrassing land areas and the use of grass in the farming system, and for the improvement and development of grasses and other forage plants suitable for use under subhumid, semiarid or dry-land conditions. An appropriation of $76,000 appropriated in the Third Deficiency Act, 1937, is being expended during 1938 for expanding the facilities at the United States Southern Great Plains Field Station, Woodward, Oklahoma, through purchase and preparation of 480 acres of land and the construction of dam, reservoir, and a water distributing system for irrigating nurseries, breeding material, and other plantings in these experiments. The increase of $15,000 recommended for 1939 will be needed for properly maintaining and utilizing these facilities and coordinating the work with investigations of the Division of Forage Crops and Diseases and other interested agencies on the many complex problems of the "dust bowl".

Under the subappropriation "Forage Crops and Diseases" will be found an estimate for $10,000, which is a fundamental part of this revegetation project, and will be used to study agronomically grass species especially adapted to conditions in the Southern Great Plains; to study morphologically and physiologically the vegetative and reproductive responses of important grass species to environmental conditions in the "dust bowl"; and to determine methods by which these species might be utilized in revegetation of ranges for soil conservation and grazing purposes.

WORK UNDER THIS APPROPRIATION

General.--Under this appropriation the problems of agricultural and horticultural development of the Great Plains and intermountain areas, a region classed as semiarid, are studied at field stations to obtain the fullest possible information concerning soil and climatic conditions throughout the region and the agricultural effectiveness of each of the many different methods of tillage and crop rotations that can be considered as more or less suitable for this region where irrigation is not available.

Field stations are maintained at Akron, Colo., Tucumcari, N. Mex., Mandan, N. Dak., Lawton, Okla., Woodward, Okla., Big Spring, Tex., Dalhart, Tex., and Sheridan, Wyo.

Investigations are also conducted at stations maintained by the Division of Western Irrigation Agriculture, Bureau of Plant Industry, at Huntley, Montana, and Newell, South Dakota.

Investigations also are conducted in cooperation with States at State stations located at Colby, Kans., Garden City, Kans., Moccasin, Mont., Dickinson, N. Dak., Archer, Wyo., Hays, Kans., Havre, Mont., North Platte, Nebr., and Pendleton, Oreg.

Dry-land agriculture investigations are conducted under these main activities, as follows:

(a) Dry-Land Field Crop Production Investigations.--The work under this project consists of rotation and tillage experiments with cereal crops, forage crops, and cotton, as well as studies of pasture conservation and development, under dry-land conditions in the Great Plains area.. (The Bureau of Animal Industry cooperates with livestock experiments at Big Spring, Texas). Crop rotation, cultural methods, and pasture practices are concerned not only with the immediate effects, but with the cumulative effects, in increasing, maintaining, or decreasing the productivity of the soil.

(b) Dry-Land Fruit and Vegetable Production Investigations.--The work under this project consists of demonstrations of the feasibility of growing in this semiarid region certain fruits and vegetables which can be produced on a home-garden scale.

(c) Cooperative Shelterbelt Demonstrations and Experimentsl Test Plantings.--Under this project trees and ornamental plants that can be grown in dry regions are propagated and placed with experimenters for testing, and demonstrations of trees planted as shelterbelts are developed and encouraged. The dry lands naturally are treeless regions, but gratifying success has attended systematic effort to determine the kinds of trees and methods of care and culture necessary to their successful growth for shade and shelter.

(d) Regrassing Investigations in Dry-Land Areas.--This project provides for investigations at the United States Southern Great Plains Field Station, Woodward, Oklahoma, to determine the most efficient and economic methods for regrassing land areas and for the improvement and development of grasses and other forage plants suitable for use under subhumid, semiarid, or dry-land conditions. The reestablishing of grazing in many sections of the Great Plains is basic to the agriculture of the entire region. Various agencies of the Government are engaged in extensive projects in the area. In order that their program may go forward on a sound, efficient basis, more comprehensive research is necessary than has been possible with the limited funds and facilities available. Facilities were inadequate for fundamental research on grasses and other forage crops

and their utilization, required in an attack on the problems of land use in the Southern Plains, and the appropriation in 1938 was made in order to provide irrigation for nurseries, breeding material, and other plantings, and to provide needed land for experimentation. While worth-while work has been under way in the area for several years, its efficiency has been hampered by recurrent droughts, with consequent loss of valuable material and time.

(i) EXPERIMENTAL GREENHOUSE MAINTENANCE

Appropriation Act, 1938	$78,632
Budget Estimate, 1939	77,372
Decrease	1,260

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Decrease
Maintenance and operation of experimental greenhouses and adjacent experimental grounds and plots.....	$78,092	$78,632	$77,372	- $1,260(1)
Unobligated balance.....	540	- - -	- - -	- - -
Total appropriation.....	78,632	78,632	77,372	- 1,260(1)

DECREASE

(1) The decrease of $1,260 in this item for 1939 will be met by reduction in personnel (one assistant gardener).

WORK UNDER THIS APPROPRIATION

A range of thirty-two greenhouses, supplemented by a small adjacent outdoor area, is maintained, providing for experimental work with a wide range of plants. The greenhouses are operated to furnish necessary experimental facilities to the several appropriation items, particularly those dealing with the diseases of plants caused by bacteria, fungi, or nemas. Maintenance of experimental plants for hybridization or other plant-breeding or plant-physiological studies are also provided for.

(j) FORAGE CROPS AND DISEASES

Appropriation Act, 1938	$300,193
Budget Estimate, 1939	304,993
Increase.	4,800

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Increase
1. Alfalfa investigations.....	$58,700	$59,000	$57,976	- $1,024 (1)
2. Clover investigations.....	28,748	29,048	28,544	- 504 (1)
3. Soybean investigations.....	19,153	19,153	18,820	- 333 (1)
4. Lespedeza, cowpea, and miscellaneous legume investigations..	40,347	40,347	39,650	- 697 (1)
5. Grass investigations.....	147,696	152,645	160,003	+ 7,358 (2)
Unobligated balance.....	5,549	- - -	- - -	- - -
Total appropriation.....	300,193	300,193	304,993	+ 4,800

INCREASE

The increase of $4,800 in this item for 1939 consists of:

(1) A reduction of $2,558 in Projects 1 to 4, inclusive, to be met by curtailment of work.

(2) A net increase of $7,358 for grass investigations, including:

(a) A reduction of $2,642 in the allotment for "Hay and pasture grass breeding and improvement investigations," to be met by curtailment of work.

(b) An increase of $10,000 for expanding hay and pasture grass cultural and production investigations. Efforts to revegetate abandoned, over-grazed, and drought-stricken lands in the "dust bowl" have emphasized the seriousness of problems encountered in securing stands of either native or introduced species. In order to solve these problems it is essential that intensive studies be made of the life histories, the responses to climatic and soil differences, and varying cultural treatment and management of the more promising species. The proposed expansion of study under this project would be closely coordinated with related work of other Federal and State agencies in the Southern Great Plains. This increase of $10,000 covers specific research with grasses and other forage crops and is a fundamental part of the revegetation project, and is carried in the subappropriation for "Forage Crops and Diseases" because of its relationships to the other research conducted under this appropriation.

Under the subappropriation "Dry-Land Agriculture" will be found an increase of $15,000 to be used for the maintenance of facilities and the operation of regrassing and grazing experiments. Land and facilities for these investigations were provided in 1938 by the Third Deficiency Act, 1937 which carried $76,000 for these purposes.

WORK UNDER THIS APPROPRIATION

General.--Research under this appropriation includes studies in the production and improvement of plants used for hay, pasturage, and cover crops, some attention being given to fine turfs used in lawns, parks, airports, etc.; the control of diseases of these plants; determination of their relative hay, pasture, and cover-crop values, their habits of growth, mode of inheritance, seeding habits, and the possibility of their economic utilization. These studies are made under the following projects:

1. Alfalfa Investigations.--The purpose of this project is to study existing species and varieties of alfalfa which have been assembled from both foreign and domestic sources, with a view to selecting and breeding varieties specially suited to various soil and climatic conditions; study the diseases of alfalfa and effective control measures, through breeding or otherwise; and improve cultural practices as a means of rendering production as stable and profitable as possible. Species, varieties, and regional strains of alfalfa from common sources of seed are compared in a number of different regions throughout the United States. Relative winter hardiness and disease resistance are determined, hay and seed values measured, and factors influencing seed-setting with special emphasis on the effect of Lygus studied. Breeding is employed to effect improvement in hay and seed production, as well as resistance to cold and disease. Cultural studies are undertaken to solve problems arising from specific conditions. Drought, cold, disease, and other factors which periodically limit alfalfa production in various parts of the United States may be met most effectively through the use of improved farm practice, improved varieties, and methods of culture specially adapted to specific soil and climatic requirements. Hardiness in alfalfa is sought by all growers, and the results of current research indicate the possibility of making available varieties and strains possessing unusual hardiness as measured by relative resistance to drought and disease, particularly bacterial wilt--a disease which reduces the life of alfalfa from ten to three years and necessitates special cultural practices.

2. Clover Investigations.--The object of this project is to study causes of clover failure; introduce into agricultural use new species and varieties; and study the diseases of clover, cultural factors, and the possibility of breeding improved varieties. The work involves the testing of all available species, varieties, and regional strains at different field stations under widely varying environments; maintenance of nurseries of red, sweet, and other clovers for observation and as sources of breeding material; and cultural experiments, disease studies, and development of breeding technique to secure varieties resistant to disease and winter-killing. Clovers constitute the basis of good crop-rotation systems in most of the important agricultural areas of the United States. In these areas their culture is fundamental in soil conservation and livestock production. The frequent failures of red clover and cultural difficulties with sweet clover

make it necessary to continue the study of factors controlling the successful production of these important crops. The problem of retaining white and other clovers in pasture mixtures with grasses is of particular importance at this time and is commanding widespread attention. Strains of red clover far superior to common strains have been isolated, and their perfection and establishment in farm practice would reduce losses now incurred by farmers through clover failure. Comparable progress is being made with sweet clover in the Western States and with white clovers in the Northeastern States.

3. Soybean Investigations.--This project aims to improve varieties of soybeans being successfully grown in the United States and to find improved varieties for regions now lacking suitable varieties for forage, green manure, pasturage, and seed in the oil and food industries, with special attention to oil and protein content, nutritive value, grain yield, and quality of beans; to test numerous introductions and selections in various parts of the United States, in cooperation with Federal and State experiment stations; to study adaptations of soybean varieties and selections and compare their values for forage, food, and industrial purposes. A tenfold increase in the total production of soybeans in the United States between 1925 and 1937 brought this crop to a position of major importance industrially as well as agriculturally. Its use as a forage plant will continue and probably greatly extend, and with the rapid development of the soybean oil and food industries a considerably increased acreage for seed production may be expected. There are more than 100 oil mills and food factories in the United States which have a crushing capacity of 50,000,000 bushels of soybeans annually. The seed crop alone in 1936 was valued at $32,791,000, and this is estimated as representing about one-third of the total value of the soybean crop in that year. Soybeans are very susceptible to soil and climatic influence, and there is need for continued research to satisfy both agricultural and industrial demands for superior varieties.

4. Lespedeza, Cowpea, and Miscellaneous Legume Investigations.--The object of this work is to determine the best species of lespedezas, cowpeas, and crotalarias, leading summer forage and cover crops, and varieties of vetches and other winter legumes; to study cultural problems and methods of utilization in soil conservation, forage, and other uses; to select improved varieties, study seed-supply problems, and try to develop disease-control measures; to test seed of all available species and varieties at appropriate field stations, and determine the best methods of production and utilization. By far the greatest part of the land south of the Ohio and Potomac Rivers and from the Atlantic Ocean to the Ozarks consists of acid soils. On these soils alfalfa and clover can not be grown without excessive liming, at prohibitive cost. The need for finding acid-tolerant crops which will grow on these soils and thereby aid in soil conservation, and at the same time furnish forage, is imperative. The Bureau of Plant Industry already has introduced one lespedeza so well suited to soil and climatic conditions in the region described that in ten years the acreage has increased from nothing to 7,000,000 acres. Continued shifts in agriculture, calling for summer pasturage, will result in extended use of these crops. In the meantime, some winter-acid-tolerant legumes, as Austrian peas, are being limited by disease, and the problem of developing varieties resistant to disease has arisen to demand active interest on the part of plant breeders and pathologists.

5. Grass Investigations.--This project includes the test of introduced and native species and the selection and breeding of superior varieties and regional strains for use as hay or pasturage or in fine turfs; study of the reaction of grasses to various environmental factors and different intensities of use; study of growth and fruiting habits or life history of grasses as a means of insuring full utilization and adequate seed production; development of disease control measures; comparison of species and varieties under field conditions in various parts of United States; selection of superior strains of different types and their study with reference to productiveness, nutritive value, and seeding habits; further improvement through hybridization; development of methods designed to insure seed supplies of the more promising strains; and cultural tests to determine suitable methods of seeding and establishing turfs and of maintaining them under use, free from weeds and diseases. Over one-half of the total land area of the United States is utilized in some degree as pasturage. Grasses are the foundation of practically all pasture flora and, in addition, they contribute over one-third of the hay produced in the United States. Their high value as soil cover in soil-erosion control is generally recognized, as is their importance in lawns and fine turfs for ornamental and recreational use or for the protection and beautification of highways and railroad right-of-ways. Major adjustment in agricultural practice in the interest of soil conservation and for other reasons are calling for still wider use of grasses, and it is likely that an urgent demand for information pertaining to them will persist indefinitely. Yet, with no other forage plants is there a greater lack of definite information on species, varieties, possibility of improvement, and use. The greatest possible use of grasses will not be realized until knowledge concerning these important forage plants is increased to a point where it will be as intimate and comprehensive as present knowledge of corn and other cereals.

(k) FOREST PATHOLOGY

Appropriation Act, 1938	$259,592
Budget Estimate, 1939	255,392
Decrease.	4,200

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Decrease
1. Diseases of forest trees and forest products, Investigations of	$124,773	$134,857	$132,569	- $2,288(1)
2. Diseases of shade trees, shrubs, and chestnut orchards, Investigations of.....	50,732	51,716	50,948	- 768(1)
3. Epidemic tree diseases, Investigations of.....	72,122	73,019	71,875	- 1,144(1)
Unobligated balance.....	4,465	- - -	- - -	- - -
Total appropriation.....	252,092	259,592	255,392	- 4,200(1)

DECREASE

(1) There is a decrease of $4,200 in this item for 1939 under Projects 1-3, which will be met by curtailment of work.

WORK UNDER THIS APPROPRIATION

General.--Under this appropriation investigations are conducted on the diseases of forest trees, shade trees, and shrubs, with particular reference to control methods; also studies on the decay and discoloration of logs, lumber pulpwood, posts, and other forest products. The same organisms frequently cause diseases of both forest and shade trees, and some of the fungi found in structural timber may also cause losses in standing trees. The National Government, in its Forest and Park Services, directly controls large forest areas; hence these investigations are of direct service to the Government in the administration of its own properties in addition to their value to private wood producers and wood users. The State agricultural experiment stations are paying relatively little attention to forest and shade-tree diseases. The extensive development in forestry during recent years, including such activities as the soil-erosion work, enlargement of national forests in the East, State and Government civilian conservation camp work, and the Tennessee Valley development, have all placed increasing demands on the services of the pathologists of this Division.

Tree-disease work, in cooperation with the U. S. Forest Service and in some cases with State agencies, is conducted at the following points: San Francisco, Calif.; New Haven, Conn.; New Orleans, La.; Albuquerque, N. Mex.; Asheville, N. Car.; Portland, Oregon; Philadelphia, Pa.; and Madison, Wis. Work on the Dutch elm disease is conducted at the cooperative field stations at Morristown, N. J., and Wooster, Ohio. The major portion of the shade-tree work is centered at New Haven, Conn., though each of the other branch offices does some work on this general problem with particular reference to the surrounding region.

1. Diseases of Forest Trees and Forest Products.--Work under this project, carried on mainly at the experiment stations of the Forest Service, consists of investigations of the native diseases attacking forest nursery stock, plantations, and standing trees in the forest, as well as the fungous discolorations and decays of logs, lumber, etc. Research on the long-introduced diseases, chestnut blight and white-pine blister rust, is also included, forming a basis for the development of resistant forest chestnuts and for the local control of the rust.

The management of Government, State, and private forests on a profitable basis depends upon the prevention of loss from disease and decay. Nursery diseases must be controlled, both for economical production of planting stock and to insure healthy trees for starting field plantations. Because of the long life of forest trees, study of their diseases must be continuous over a period of years. The new method of approach is to consider the effect of diseases on the stand and the timber yield rather than on the individual tree and aims at preventing losses through changes in the methods of forest management rather than by individual treatment. Investigations of fungous

injury to forest products are under way, including the last phases of a campaign against sap stain, for which the Southern lumbermen furnished part of the funds, as well as investigations of other problems to meet the demands for information by various groups of wood producers and consumers. The improved control methods developed in this work have already come into large-scale use and are resulting in better lumber for the domestic consumer, as well as aiding Southern lumber to compete in the foreign market. Southwestern farmers have been aided in securing durable fence posts. A service of unique type has been rendered to forestry in the determination for several forest regions of the methods of logging slash disposal that favor most rapid decay and thus decrease of the fire hazard. (The Forest Service, Bureau of Chemistry and Soils, Soil Conservation Service, and Bureau of Entomology and Plant Quarantine are cooperating.)

2. Diseases of Shade Trees, Shrubs, and Chestnut Orchards.--Street, park, and ornamental trees make up a material part of the wealth of this country. Intangible values, such as reduction of temperature in summer and the enhancement of the beauty of a place, are difficult to estimate. Losses of trees from diseases, unfavorable climatic factors, and decay of the heartwood, with resulting breakage, are taking place in every locality of the country. The primary object of the work under this project is the prevention and reduction of these losses. Most of the diseases have never been investigated and others have been only partially studied. Improved methods of tree repair and better wound dressings are being studied. However, a large part of the funds in this project is required to determine the diseases and answer the correspondence sent in by the general public.

The increased number of visitors in National and State parks have created new problems, particularly with reference to the packing of soil around the more valuable trees and diseased conditions resulting. Many invaluable sites have already been severely injured. These problems and various others dealing with park conditions are being studied in cooperation with the National Park Service and some of the State parks.

The incipient chestnut-orchard industry in the East was wiped out by chestnut blight. Blight-resistant strains of chestnut introduced by this Bureau are being extensively tested as a basis for an orchard industry. Among many thousands of seedlings, those in which resistance to the blight and root disease are combined with desirable horticultural qualities are being selected. Extensive breeding work to secure valuable hybrids is under way. As we normally import 20 to 25 million pounds of chestnuts from Europe, this is an agricultural industry that can be developed without danger of overproduction for many years. In the Western States, where the blight is not yet established, most of the planted chestnuts are blight susceptible, and efforts are being made to eradicate the few infections already found in that region and to put the industry on a basis of blight-resistant trees.

3. Epidemic Tree Diseases.--This project covers the investigation of diseases of forest and shade trees when they first appear in the United States. Knowledge of the causal agents and their behavior and the discovery of control methods may at that time make possible the ridding of the country of these

diseases before they become established. Like the Red Cross, the work must meet the emergencies when they arise. The Dutch elm disease, discovered in a small way seven years ago in Ohio and more recently in Maryland, Virginia, West Virginia, and Indiana, is now very serious around New York City, in New Jersey, New York, and Connecticut, where thousands of affected trees have been found. It threatens the life of the American elm. The investigations made under this project furnish the foundation for the joint Federal and State eradication campaign now under way. The European larch canker infection found in Massachusetts is important to the larch forests of the Northern and Western States. The cause and control of a canker disease of pitch pines is being studied. It is apparently serious on the slash pine of the Southeastern States, so important in turpentine production and of promise for the paper industry. An apparently threatening twig blight of the ponderosa pine in Arizona and New Mexico is being evaluated in its relation to that important pine. Willow scab has spread over New England and southwesterly through New York and Pennsylvania and has recently been found in the mountains of North Carolina. This disease has an important bearing on the use of willows in erosion control. A killing disease of the wild persimmon in Tennessee is being investigated. The American persimmon is important in erosion control. (Bureau of Entomology and Plant Quarantine cooperating.)

(1) FRUIT AND VEGETABLE CROPS AND DISEASES

Appropriation Act, 1938	$1,179,482
Budget Estimate, 1939	1,159,182
Decrease.	20,300

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Decrease
1. Deciduous fruit investigations	$259,061	$287,297	$282,182	- $5,115(1)
2. Citrus, avocado, and other subtropical fruit investigations.....	108,767	109,539	107,755	- 1,784(1)
3. Nut investigations.....	120,378	121,716	119,524	- 2,192(1)
4. Vegetable investigations.....	211,675	228,093	223,932	- 4,161(1)
5. Floricultural and ornamental horticultural plant investigations.....	72,300	73,288	71,961	- 1,327(1)
6. Nursery stock and farm windbreak investigations.....	66,807	67,230	66,848	- 382(1)
7. Potato investigations.....	78,014	78,634	77,223	- 1,411(1)
8. Methods of handling, transportation, and storage, and market diseases of fruits, vegetables and flowers, Investigations of	167,240	169,485	166,443	- 3,042(1)

PROJECT STATEMENT - Continued

Projects	1937	1938 (Estimated)	1939 (Estimated)	Decrease
9. Investigations of variety, suitability, and quality in relation to fruit and vegetable utilization.....	$43,858	$44,200	$43,314	- $ 886(1)
Unobligated balance.....	12,354	- - -	- - -	- - -
Total appropriation.....	1,140,454	1,179,482	1,159,182	- 20,300(1)

DECREASE

There is a total decrease of $20,300 in this item for 1939 distributed under Projects 1 - 9, which will be met by curtailment in allotments for these projects.

WORK UNDER THIS APPROPRIATION

General.--Under this appropriation investigations are conducted to determine the best methods of culture, propagation, breeding, selection, disease control, and related activities as affecting the most profitable production of high-quality orchard fruits, small fruits, nuts, vegetables, ornamentals, nursery stocks, and related plants. The interrelation of various orchard-management practices and problems concerned with the nutrition and physiology of the various horticultural plants are studied. Investigations for determining the best methods of harvesting, packing, shipping, and storing horticultural products are conducted, including studies of the physiological and related changes in perishables during marketing and storage. Suitability of different horticultural varieties for the making of byproducts is determined. In addition to cooperative activities with the State agricultural experiment stations, other bureaus of the Department of Agriculture and the Bureau of Indian Affairs of the Department of the Interior, field stations, laboratories, and offices are maintained at the following points:

Field Stations (Government-owned land)

Beltsville, Maryland
Brownwood, Texas (long lease)
Charleston, South Carolina
Cheyenne, Wyoming (long lease)
Fresno, California
Indio, California
Meridian, Mississippi
Oakville, California
Robson, Louisiana

Field Stations (land furnished)

Eustis, Florida
Fort Valley, Georgia
Greeley, Colorado
Palo Alto, California
Philema, Georgia
Presque Isle, Maine
La Jolla (Torrey Pines), California
Willard, North Carolina

Field Laboratories

Albany, Georgia	Logan, Utah	Pomona, California
Austin, Texas	Los Angeles, Calif.	Riverside, California
Chicago, Illinois	Madison, Wisconsin	Shreveport, Louisiana
Corvallis, Oregon	Medford, Oregon	Columbia, Missouri
East Wareham, Mass.	New York, New York	Vincennes, Indiana
Fayetteville, Ark.	Orlando, Florida	Wenatchee, Washington
Hood River, Oregon	Pemberton, New Jersey	Yakima, Washington

Field Offices

Riverside, California Sacramento, California

1. Deciduous Fruit Investigations.--These investigations cover production, breeding, and disease control for apples, pears, peaches, cherries, plums, apricots, grapes, raspberries, strawberries, cranberries, and other orchard and small fruits. The influence of pruning, fruit thinning, soil-improvement crops, fertilizers, and other orchard management practices on yield, regularity of crops, and quality of fruit is studied; also the functioning of fruit trees under varying soil moisture conditions. Cultural methods for strawberries, including effects of different plant nutrients on production, firmness, and quality of the fruit, are under investigation. The best root stocks and varieties for grapes in the Southeast and in the vinifera grape regions, especially in California, are being determined. Through fruit breeding and bud selection studies with apples, pears, peaches, plums, grapes, raspberries, strawberries, cranberries, and other small fruits, improved varieties of high quality and disease resistance are being developed. Through introduction, selection, and breeding, fruits are being developed that are adapted to withstand severe drought and cold conditions. Destructive fungous, bacterial, virus, and physiological diseases of all the more important kinds of deciduous fruits are studied for the purpose of determining their life histories, methods of dissemination, means of infection, and methods of control through spraying, disinfection, fumigation, eradication, breeding of resistant varieties, or other means. Efforts are made to develop new sprays superior in effectiveness to those now generally in use and which will not cause injury to host plants. These investigations are designed to determine methods for reducing the cost of production and at the same time result in a more uniform and stable production of high-quality fruit.

Immense investments are represented by the apple and other deciduous fruit industries. The production of apples varies from around 140,000,000 to more than 200,000,000 bushels annually, with a valuation ranging from about $100,000,000 to nearly $178,000,000, depending on crop and market conditions. The annual valuation of the peach crop formerly averaged around $60,000,000, though in recent years the average has been only about half that amount. The grape crop in recent years has had an average annual value of some $30,000,000; in former years the average was from two to three times as great. The strawberry crop in normal years has a farm value of $35,000,000 to $38,000,000. The farm value of the other deciduous fruits adds many more millions of dollars to the total. Annual losses due to the more prevalent fruit diseases have been estimated at about $50,000,000.

Disastrously large proportions of fruit crops are frequently lost by growers, their income being reduced proportionately. The development and use of suitable control methods would largely prevent such losses and aid greatly in stabilizing yearly production - a factor of basic importance to the grower and consumer alike and to the fruit industry generally. One of the most serious handicaps to the farmer of fruit production is the wide fluctuation from year to year in the size of the crop and its cash return. The orchard management studies are projected with a view to inducing regular annual crops of high quality. Specific methods, often quite different, must be developed because of the different regional conditions under which fruit is grown. Most fruit varieties in cultivation originated as chance seedlings and many of them are faulty in various ways. Fruit breeding is conducted to develop disease-resistant varieties having better eating quality and varieties better adapted to various local conditions and having superior merit for shipping, storing, canning, drying, or preservation by other methods. The bud-selection work accomplishes similar results by taking advantage of bud mutations as they occur in nature. These lines of investigations are for the purpose of aiding fruit growers in the solution of problems which seriously reduce net income and which as individuals they are not in a position to solve.

2. Citrus, Avocado, and Other Subtropical Fruit Investigations.--Efforts are being made through breeding and bud-selection methods to develop improved citrus varieties resistant to disease and capable of producing more regular and profitable yields. More satisfactory root-stocks are being sought, and the effects of pruning, soil management, fertilization, and leaf area on the yield, texture, storage, and shipping quality are being determined. Especial attention is being given to all production problems concerned in growing Satsuma oranges in the Gulf States. Variety studies, studies of pollination, pruning, and soil-management requirements, breeding and propagation investigations, and studies of factors affecting quality are being conducted with dates, avocados, mangos, figs, and other subtropical fruits. Diseases of citrus and other subtropical fruits are studied to determine their causes, methods of dissemination and infection, effects on the host plants, and the most effective and practical means of prevention or control.

For the years 1931-34 the average farm value of citrus fruits was about $98,000,000. The corresponding figure for the years 1935 and 1936 was $206,300,000. The average annual production of avocados for the 5-year period 1928 to 1932 was 2,156 tons, having an average farm value of $518,000. The date crop amounts to about 5,500,000 pounds annually and is increasing. Similar figures for the mango and other subtropical fruits are not available. Certain of these fruits, such as the date, can be grown successfully in many of the hot interior valleys of the Southwest and will furnish a profitable crop for such regions if their cultural requirements can be determined. Avocados and citrus fruits furnish profitable crops for several of the Western and Southern States.

3. Nut Investigations.--The work under this project varies widely with the kind of nut and the region where grown. The merits of almond varieties are determined and improved varieties are being developed by

breeding. Cultural requirements of the pecan to induce regular annual crops of well-filled nuts are being investigated. Habits of blossoming and pollination requirements of Persian walnut varieties as influencing yields are determined. Those conditions most favorable to growth and production of filberts are being studied. The merits, range of adaptability, and possibilities of black walnuts, various hickories, chestnuts, hazels, and other nuts are studied. The breeding and selection of improved varieties of filberts, walnuts, and other nuts are in progress. Serious diseases of pecans, walnuts, and filberts are being studied to determine their nature and modes of spread and development, and effective and economical methods of prevention or control are being worked out.

The average production of almonds in California for 1933-35 was 10,300 tons, average value $2,300,000; Persian walnuts, 42,000 tons, average value over $8,200,000; and the value of filberts in Oregon ranged in 1931-34 from $85,000 to $300,000 a year. Pecans, representing the one native nut of primary importance, averaged a yield of about 65,000,000 pounds for the years 1933-36, with range in valuation of from nearly $4,200,000 to $6,000,000 per year. The value of nuts for food purposes is generally recognized. Serious production problems exist with each crop. Many almond varieties of inferior value have greatly handicapped merchandizing the crop. Varietal studies have helped to determine those to discard. The need of improved varieties has been partially met in breeding work that is in progress. The pecan is a native nut only comparatively recently brought into cultivation in orchard form. Cultural requirements are largely unknown. Irregular and small crops of poorly filled nuts are disastrously frequent. Cultural methods that will overcome these difficulties must be determined if the pecan industry is to succeed. Many Persian walnut orchards have habitually been unproductive. The determination of cross-pollination requirements of the varieties has shown that such orchards may be made more productive and profitable when suitable cross-pollination is provided. Widespread interest prevails in the various hickories, black walnuts, butternuts, hazels, and other nuts suitable for growing in Northeastern United States. Collections are being made throughout the country of as many desirable wild seedlings as can be found, and these should be grown under uniform conditions to determine the value from the standpoint of quick growth, disease resistance, and uniform yields of high-quality nuts. Considerable plantings of tung nut trees have been made in recent years in the southern coastal plain region for the commercial production of tung oil, which is imported to the amount of about 100,000,000 pounds annually and extensively used in varnish manufacture and for other industrial purposes. The culture of this tree, new to North America, presents many problems in propagation, cultural requirements, orchard management, varietal selection and breeding, and disease control.

4. Vegetable Investigations.--These activities include studies of improved methods of handling seed, production of plants in plant beds, and establishing field plantings; studies of the adaptability of specific crops and varieties to different regions as affected by water supply, temperature, and other meteorological factors; the causes and control of numerous nonparasitic diseases or abnormal growth and development troubles of vegetable crops; the study of fungous, virus, and bacterial diseases, their life

histories, modes of dissemination and infection, and methods of control or prevention; the factors determining high culinary and market quality in vegetable products and methods of their control; the breeding and selection of disease-resistant vegetable varieties of improved culinary and market quality to meet specific market, shipping, or manufacturing requirements; the establishment of nationally applicable standards and descriptions of commercially important varieties. Cultural, varietal, and breeding investigations are made in relation to the successful production of vegetable crops under the drought and low-temperature conditions of the Great Plains area. Special breeding or selection investigations for disease resistance are being conducted with lettuce and muskmelon in California; celery in Florida; tomatoes in Florida, Utah, and California; peas and beans in Colorado, Washington, Idaho, and Oregon; cabbage in Wisconsin; potatoes in Maine, Minnesota, Michigan, Iowa, North Dakota, Louisiana, Maryland, and other States; and sweetpotatoes in Mississippi, Virginia, and Maryland.

According to the 1930 census and data of the Department of Agriculture, the total farm value of the crops receiving consideration in this project was about $800,000,000 in 1929. On account of low prices in the past few years, the total value of these crops is now far less. Losses from disease in the more important vegetables other than potatoes are estimated to amount to something like $84,000,000 annually. The estimated loss from potato disease alone is about $45,000,000, making a total estimated annual loss from diseases of $129,000,000. Much of this loss could be prevented if more effective spray materials and spraying methods could be developed. If disease-resistant varieties of high quality could be developed by breeding, great savings would result. Vegetable disease control is basic to stabilized production.

5. Floricultural and Ornamental Horticultural Plant Investigations.--Experiments with tulips, hyacinths, daffodils, lilies, and other bulbous flowering plants are conducted. The work includes a study of cultural methods and the effects of different storage conditions and handling methods on subsequent growth and flowering, the object being to regulate at will the time of flowering by appropriate treatment. Breeding and selection to develop improved types and varieties and the development of information regarding various new or little-known bulbous flowering species and types that possess potential commercial value are important phases of these investigations. Investigations are made to determine the value of different varieties of various groups of ornamental plants, including annuals, herbaceous perennials, roses, and other hardy plants and trees to determine their suitability for different uses and their adaptability to different climatic and other conditions. The arrangement of plant material for ornamenting home grounds and public buildings is studied, and the selection and use of plants and trees for park and roadside planting and for farm homestead improvements are receiving attention. Investigations are conducted on important diseases of roses, azaleas, boxwood, and other ornamental shrubs, florists' stocks, and flowering bulbs, with a view to determining the cause, means of spread, conditions influencing outbreaks, and methods of satisfactory control or prevention.

The main object of bulb culture investigations is to develop information needed by producers of bulbs in this country. Bulb production is an important industry and American planters use domestic rather than imported bulbs. In 1929 there were imported into this country 235,000,000 to 250,000,000 bulbs, including hyacinths, tulips, daffodils, crocus, lily, and other commonly grown stocks. The value was nearly $7,000,000. In 1932 the importation of the same items was 140,000,000 to 150,000,000 bulbs, with a value of about $2,260,000. Many American growers, largely as a result of these investigations, are now producing supplies of bulbs formerly imported. In these investigations methods are being developed that greatly simplify cultural practices and reduce cost of production. By use of special methods of storing and handling, practices are being originated so that florists may secure blossoms of iris and daffodils several weeks in advance of the usual time of blooming and at periods when good demand for them can readily be developed. This greatly extends the "forcing season" for these items, and at little or no added expense to the growers. More than 100 lily progenies from breeding work are being developed. Several lily hybrid selections of much promise and representing new types have been brought to the stage of introduction. These and other investigations of great potential promise to the industries are in progress.

With the expanding interest in recent years in the growing of ornamental plants, disease problems began to multiply, with corresponding demands made on the Department for help. Because of the universal interest in an extensive planting of roses and the seriousness of certain diseases, particular attention has been directed to them with a view to finding effective and practicable means of control. A similar situation prevails with respect to bulbs, lilies, and ornamental plantings. The work is directed to particular disease troubles that cause serious loss to the producers of particular kinds of florists' and ornamental stocks as well as to the purchasers and planters. There are no complete figures available on the loss due to diseases of ornamental plants. An estimate has been made of $2,500,000 annually due to diseases of greenhouse roses alone. The continuance of certain famous azalea gardens and boxwood plantings in the South is apparently contingent on the development of a satisfactory means of controlling very serious diseases that have recently attacked them.

The 1930 census report shows that in 1929 nursery sales included about 110,000,000 specimens of ornamental trees, shrubs, and other similar plants (not counting annuals, bulbs, and herbaceous plants). On April 1, 1930, there were growing in nurseries of the United States, for further development and future sale, about 340,000,000 specimens of the same items. The sales of florists' stocks, roses, carnations, and the like, grown in greenhouses and in the open during 1929, amounted to more than $98,000,000. The study of this type of material to determine the varietal merit and effectiveness and adaptability to different conditions and uses is necessary in order to supply information constantly and increasingly in demand by the public, also to determine the best methods of culture, including pruning, fertilizing, and general care. The development by selection of improved varieties, particularly of hardy chrysanthemums, to provide early and desirable flowering types for regions where the growing season is comparatively short, is yielding results of large potential importance.

6. Nursery Stock and Farm Windbreak Investigations.--This work consists of selecting and determining the merits, both from the nurseryman's and the fruit grower's point of view, of different root stocks for use in propagating apple, pear, peach, plum, and cherry trees. Suitable vigorous and disease-resistant root stocks for outdoor hybrid tea roses and for use in propagating rose plants for greenhouse forcing are being studied. Studies are being made of the propagation of other ornamentals, including also the propagation of fruit and rose stocks from seed and by grafting, layering, and cuttings. Experiments in the proper storage of nursery stock to determine optimum moisture and temperature conditions for best results are being made. Investigations are made of crown gall and other diseases of nursery stock and of various root diseases of fruit trees, with a view to determining their cause, the factors influencing their development, and the best means of prevention or control. Investigations are made relative to the best species of trees to use for windbreaks, both under dry and irrigated conditions, in the Great Plains area, the best methods of planting and tree arrangement from the standpoint of checking wind velocity and snow drift, and the relation of the windbreak to the prevention of soil blowing and the retention of moisture.

Nursery sales during 1929, according to the 1930 census report, involved approximately 186,000,000 trees, shrubs, and other plants (excluding strawberry and other berry plants). As of April 1, 1930, the nurserymen had growing for further development and future sales nearly 490,000,000 of the same items. The value of the sales in 1929 amounted to about $95,000,000. Relatively little research work for the benefit of the nursery industry has been done in this country. Many of the problems concerning suitable understocks, methods of propagation, and the winter storage of nursery stock remain unsolved. An understock may lack hardiness or congeniality with the variety grafted on it, or it may lack insect or disease resistance, or adaptability to soil conditions, or in other ways it may lack qualities necessary to make it of permanent value to the planter. Great losses to both nurserymen and fruit growers have occurred in the past from the use of unsuitable root stocks. More rapid, less tedious, and less costly methods of propagating certain kinds of stocks are needed. Heavy losses from the destructive effects of improper storage conditions during winter are often suffered. Research on storage conditions for optimum results should save many thousands of dollars in such losses. Improvements in methods of disease control will prevent large losses and have a stabilizing effect on the industry. The best selection and proper arrangement of trees for windbreak planting in the Great Plains area should result in a more profitable agriculture and better and more pleasant surroundings in which to live. While living conditions in this area should be made much more pleasant, the effect on conditions of crop production should result in greatly increased financial returns to the owners.

7. Potato Investigations.--These investigations fall mainly into three groups: (1) Breeding and selection to develop new varieties that possess superior table quality, better adaptability to diverse soil, climatic, and other conditions, and resistance to disease; (2) cultural methods, including storing and handling of seed stocks to obtain optimum results; and (3) studies of the fungous, bacterial, virus, and physiological

diseases of potatoes, their causes, modes of spread, effects on the plant, conditions influencing outbreaks, and methods of control or prevention. Breeding and selection work is carried on cooperatively in important potato-producing States -- Maine, Virginia, Maryland, North Carolina, New York, Michigan, Iowa, Minnesota, and others. Cultural investigations are conducted to determine the most profitable quantity of seed to use; time of cutting seed, and manner of handling thereafter; best methods of planting; most efficient use of fertilizers; amount of irrigation necessary in different regions; and effect on results of storing seed stocks at different temperatures and humidities.

The average farm value of the potato crop for the five years 1931-35 was about $193,500,000. In some years the value is as much as $477,000,000. The potato crop is vastly important to the farmer; it is the most important vegetable crop to the consumer based on volume used. Though extensive commercial production is restricted to perhaps a dozen States, the potato is the most universally grown of all vegetable crops. Problems of production are as varied as the diverse conditions under which the crop is grown. Low yields per unit of land prevail generally. Stabilization of production through greatly increased yields per unit of land, thus reducing acreage and lessening costs of production; better handling of seed stocks; and the development of varieties of superior quality and resistant to disease are some of the principal means of bettering the potato industry, particularly the producer. The estimated loss from potato diseases is about $45,000,000 annually, and any improvement in efficiency or economy of control measures would result in large financial savings.

8. Methods of Handling, Transportation and Storage, and Market Diseases of Fruits, Vegetables, and Flowers.--Experiments are conducted to determine the most effective methods of cooling and refrigerating fruits and vegetables in transit; best methods of car heating to prevent freezing while in transit during extremely cold weather; methods of controlling diseases of fruits and vegetables in transit, in storage, and while on the market; also the effect of ethylene and other gases in coloring fruits and vegetables. Methods of removing spray residues are investigated. Studies have been made of storage conditions, especially relating to temperature, humidity, duration of storage period, and ripening conditions after removal, which produce optimum results for canning, fresh fruit utilization, or for other purposes. As a result, some products of excellent quality have been obtained from types of fruit previously supposed to be unpromising for the purpose. Various other problems relating to handling, transporting, and storing perishable products are receiving attention.

Vast losses of fruits and vegetables occur in transit, in storage, and on the market as a result of disease, freezing in transit, or other conditions adverse to the product. Investigations that include the history and condition of the fruit when shipped or stored and the temperature and other conditions during transit by rail, boat, or other means and during storage and marketing periods are essential to get at the facts needed in correlating cause and effect. The removal of spray residues necessary to bring these products within legal requirements of tolerance has presented complicated problems that are entirely beyond the facilities and ability of growers and shippers to solve for themselves. The use of ethylene and other gases in treating citrus fruits for the purpose of eliminating the green color in fruit that is commercially mature requires

research to determine the limit of usefulness of the process, methods of application, effect on the fruit, and other like factors, so that the growers, shippers, and the industry generally may take full advantage of its beneficial possibilities. The working out of storage and ripening details in handling Kieffer and other pears of the same type, that result in a greatly improved quality of fruit for canning and other purposes, should add very materially to the value of a type of fruit grown extensively and widely and which heretofore has had a relatively small value, in part because of its poor eating quality. These and other lines of investigations have aided and are continuing to aid very greatly in the handling of perishable products.

9. Investigations of Variety, Suitability, and Quality in Relation To Fruit and Vegetable Utilization.--This work includes the study of horticultural varieties of fruit and vegetables in relation to their suitability for various standard methods of processing and manufacture to determine what varietal characteristics influence the appearance, palatability, and food value of the product, with view to developing by breeding and selection improved types that will furnish superior products; to study, in the case of a particular variety, the effect of varying storage and environmental conditions and cultural practices on its suitability for processing, on the quality of the product, and on the composition of the raw and processed product; and to conduct such physiological and related biophysical and biochemical studies as are necessary to determine differences in suitability of the crop materials for processing and in quality of the products.

The best figures available give the aggregate value of "canned and processed vegetables and fruits, and pickles, preserves, jams, jellies, and sauces, all industries," for 1929 as $721,845,902. The corresponding figure for 1931 is $481,416,068, a difference of a little over 33 percent between these two seasons. Even in seasons of comparatively light packs the quantity of fruit and vegetable products preserved by canning, freezing, and in other ways is impressive. Experience in the past has shown that improvement in appearance and quality of the pack increases consumer demand and widens the markets for such products, with consequent benefit to the growers of the raw materials. Varietal characters, stage of maturity, and factors of growth have a direct bearing on the appearance, palatability, and food value of the preserved products. The most profitable utilization of fruits and vegetables must be based on the suitability of different varieties for the particular methods of processing or manufacture.

(m) GENETICS AND BIOPHYSICS

Appropriation Act, 1938 . . . . . $31,675
Budget Estimate, 1939 31,675

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
Genetics and biophysics investigations.....	$31,134	$31,675	$31,675
Unobligated balance.....	541	- - -	- - -
Total appropriation.....	31,675	31,675	31,675

WORK UNDER THIS APPROPRIATION

The work under this appropriation includes studies chiefly with corn and its wild relatives, of the mechanism of inheritance, by which plant characters are transmitted from one generation to the next; exploration of the possibilities of inducing new characters by various kinds of radiation, such as X-rays, heat, and light; and investigation of the possibility of influencing the growth of plants by modifying certain elements of the environment, with special reference to X-rays and to light of specified wave lengths or colors. The investigations are carried on in the laboratory and at field stations operated by other divisions of the Bureau.

The justification for this work lies in the importance of a thorough knowledge of the mode and the mechanism of inheritance as a guide to the improvement of plants by breeding, of producing entirely new forms of plants that might have useful characters, and of determining the action on plant growth of electrical, photoelectrical, and other radiations. The results achieved in previous years have made valuable contributions to a knowledge of heredity of importance to an understanding of plant breeding. Results have been obtained on the effect of light of different wave lengths on the growth of corn and other seedlings.

(n) MYCOLOGY AND DISEASE SURVEY

Appropriation Act, 1938 . . . . . $45,818
Budget Estimate, 1939 45,818

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
1. Investigations, identification, and collection of fungi.	$15,887	$16,029	$16,029
2. Plant disease survey.....	22,136	22,263	22,263
3. Mushroom investigations.....	7,456	7,526	7,526
Unobligated balance.....	339	- - -	- - -
Total appropriation.....	45,818	45,818	45,818

WORK UNDER THIS APPROPRIATION

General.--Research under this appropriation includes the collection and study of plant parasites and other fungi, surveys of plant diseases in the United States, and investigations on the culture and diseases of mushrooms.

1. Investigations, Identification, and Collection of Fungi.--This project is concerned with the identification of fungi of all groups for Federal and State workers, students, teachers, and the general public; with supplying information on fungi to those interested; with the preparation of detailed studies of various fungus groups as a basis for routine identifications; and with the upbuilding and maintenance of a representative collection of the fungi of the world for reference and study purposes. Special problems include the study of fungi attacking insects, of poisonous and edible field and forest mushrooms, and of parasites of destructive fungi, as well as the comprehensive indexing of the literature on plant diseases and fungi in general, in cooperation with the Plant Disease Survey. A fungus exchange service is maintained both as a means for securing new and valuable materials for the national collection and to supply workers in the State experiment stations and elsewhere with specimens needed for research or instructional work.

This project operates as a national service unit along the above lines, and the extent of the identifications made and the number of responses to requests for fungus information supplied reach a total limited only by the size of the staff. The fungus collection now totals over 300,000 specimens, with supplementary collections of photographs, microscopic preparations, and necessary covering indexes, and is one of the largest and most comprehensive of its kind in the world.

2. Plant Disease Survey.--Work under this project consists of collecting by means of surveys and through cooperation with State institutions and other agencies current information as to the occurrence, prevalence, rate of spread, and seasonal and geographical distribution of plant diseases in the United States, and the losses caused by them, as well as to the appearance of new and dangerous diseases or epidemics and unusual outbreaks of diseases. Files are maintained in which the information in permanent and accessible form is always available to plant pathologists and economists and others to whom they are of value. In cooperation with the Mycology projects, a file of plant disease literature of the world is maintained. By means of a mimeographed periodical, current information on the status of plant diseases in the United States is distributed to plant pathologists in this country and abroad.

The work of this project is all national or broadly regional in scope. It is noncompetitive and is organized on the basis of cooperation with and services to the State and Federal workers in the field of its activity. It functions as a clearing house for information on plant diseases and is the only agency in the country which attempts to study the significance of plant diseases and the factors which regulate outbreaks on a national basis. The service assists in predicting the appearance of new and dangerous epidemics and furnishes information necessary to prevent outbreaks. More than 150 State experiment station workers from every State in the Union are included in the list of voluntary official collaborators served by the Survey, whose reports are recorded, preserved, summarized, and distributed to interested persons and agencies currently through the project's periodical and privately through correspondence or the courtesy of the files as the occasion may arise.

3. Mushroom Investigations.--This project is concerned at present with improvements in cultural practices and sanitary procedure in mushroom houses; with studies in the life history, behavior, and control of the "truffle" disease and other destructive mushroom troubles; with the development of new noncompetitive mushroom industries through work to establish in the United States cultivation of the European truffle and the Japanese mushroom and to grow under artificial conditions the Morel and other desirable wild types; and with studies to establish fundamental principles in the physiology and genetics of mushrooms and the interrelation of aeration, temperature, and other factors in mushroom compost heaps and related problems as direct aids to the industry.

The mushroom industry of the United States represents a capital investment of approximately $15,000,000, with annual gross receipts from mushroom products of about $5,000,000. In close connection with the industry, this project has developed improved cultural practices and disease-control methods so as to lower production costs. It is also concerned with the development of similar industries through cultivation of other edible fungi (i. e., the truffle - a $6,000,000 industry in France). Popular interest is shown by the supplying, upon request, in a single year of over 50,000 copies of publications on mushroom culture and diseases. Other definite results have been the development of an artificial compost to replace horse manure, when such a step is necessary, and the control of the "bubbles" disease.

(o) NATIONAL ARBORETUM

Appropriation Act, 1938	$122,000
Budget Estimate, 1939	54,587
Decrease	67,413

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Decrease
National Arboretum:				
(a) Maintenance and operation of Arboretum.....	$19,174	$27,000	$27,000	- - -
(b) Planning, developing and construction of Arboretum	14,917	95,000	27,587	- $67,413(1)
Unobligated balance.....	216	- - -	- - -	- - -
Total appropriation.....	34,307	122,000	54,587	- 67,413

DECREASE

(1) The estimates provide for a net decrease of $67,413 in this item, as follows:

(a) Decrease of amount available 1938 for acquisition of land, $80,000.

(b) Increase of $12,587 for development of the Arboretum. The Arboretum now has available a total of 385 acres. The increase is required to clear, fence, and prepare this land for Arboretum purposes, including the additional land being purchased in 1938, and to provide additional facilities urgently needed in order that plant material may be secured and properly cared for when received, additional plant material propagated, and similar work effectively prosecuted.

CHANGES IN LANGUAGE

The following changes in language are being made:

(1) The language authorizing acquisition of land has been omitted.

(2) The spelling of the word "Arboretum" has been corrected. This error occurred during the enrollment of the 1938 Bill.

(3) The wording of this item has been amended to make it conform to the more generally accepted phraseology used elsewhere in the Appropriation

Act, and in order to more appropriately represent the work being done hereunder.

WORK UNDER THIS APPROPRIATION

The National Arboretum was authorized by Congress in an Act approved March 4, 1927 (20 U.S.C. 191-194) for research and education concerning tree and plant life. A total of 385 acres has been purchased and present plans call for the purchase of additional land. The Arboretum in its final development will contain living examples of all species of woody plants suited to outdoor cultivation in this region that will furnish the basis for breeding studies with woody plants and ecological studies, as well as botanical work. It will provide also such library, herbarium, office, greenhouse, and nursery facilities as may be needed to carry out the scientific studies. Under this appropriation routine maintenance operations are conducted on the National Arboretum. A large amount of land still remains to be cleared, and the land already cleared should be prepared for planting. Collection of material now on the ground must be maintained and prepared for planting to prevent their total loss. A nursery for the development of plants for the permanent collections has been developed but is not yet large enough. With the purchase of additional land provided for in 1938, the opening of other areas for nursery plantings will be undertaken. This appropriation covers only bare maintenance of limited propagation work and physical improvements made in the past four years, and does not permit progress on plans for substantial development.

(p) NEMATOLOGY

Appropriation Act, 1938	$48,961
Budget Estimate, 1939	48,961

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
Nematology investigations:			
(a) Plant parasitic and related nematode investigations	$41,608	$46,761	$46,761
(b) Investigations on nemic parasites of insects and other invertebrates.....	1,700	2,200	2,200
Unobligated balance.....	653	- - -	- - -
Total appropriation.....	43,961	48,961	48,961

WORK UNDER THIS APPROPRIATION

General.--It is widely known that parasitic nematodes or threadworms are the cause of numerous diseases in man and domesticated animals (hookworm, Ascaris, Trichina, etc.). It is not often realized, however, that numerous nematode species also parasitize lower animals (such as insects, millipeds, spiders, snails, etc.) or prey on plants (living in or on their roots, stems, leaves, flowers, or seeds) or live more or less free (thousands of species) in the soil and in fresh and marine waters. These nematodes, most often invisible to the naked eye because of their small size, interfere in many ways with human activities. They are the cause of some of the worst crop diseases, such as root-knot, which today is known to affect some 1,200 different kinds of plants, including a large portion of our most valuable crops (cotton, tobacco, Irish potatoes, sweetpotatoes, tomatoes, lettuce, peach trees, grape vines, etc.) and ornamental plants - even various forest trees. There is the so-called sugarbeet nematode, a very dreaded pest, which attacks some 200 different hosts, formerly known mainly as the cause of "beet tiredness" or "beet sickness" of the soil but recently the subject of very drastic measures in various potato-growing regions of Sweden, Great Britain, and Germany. Then, there may be mentioned the bulb or stem nematode, a species also known to attack some 250 different host plants and in some cases very detrimentally, e.g., narcissus bulbs, alfalfa, clover, sweetpotatoes, and Irish potatoes. Another form, the strawberry nematode, is principally known as the causative agent of strawberry dwarf or crimp but also attacks a wide variety of plants, especially ornamentals such as begonias, ferns, and chrysanthemums. Other outstanding nematode pests of plants are the wheat nematode (the cause of cockle ears), the citrus nematode, the meadow nematode, the burrowing nematode (mostly on tropical and subtropical plants like sugarcane, coffee trees, etc.), and numerous forms which are less important or little known at present.

The insect parasitic nematodes are thought to be one of nature's means of keeping insect and similar pests in control. In regions where grasshoppers never develop into damaging swarms, it is thought that parasitic nematodes of the group known as mermithids (sometimes called "hairworms" or "horsehair snakes") are the main natural controlling factor. These mermithids, however, require certain climatic and moisture conditions for their proper development and are therefore unable to exist in the semiarid regions where grasshopper plagues regularly occur.

Work of this character is of a highly specialized type, necessitating detailed training for the investigator. There are few such specialists, so that most State and private agencies must rely on the Division of Nematology as the sole agency from which to obtain information as to the possibility that a given disease may be caused by nematodes and advice as to procedure and control.

(a) Plant Parasitic and Related Nematode Investigations.--Each year activities under this project cover the examination and correspondence relating to six to eight hundred samples of plant and soil material and numerous inquiries pertaining to nematode diseases of plants and the

significance of soil-inhabiting forms for crop production and soil fertility. Such problems are presented as the significance of forms found in deteriorating lumber, or in freshwater filter beds, or in vinegar, or in animal skins during the tanning process, etc. Planned research activities comprise investigations into the life habits and development of the following plant parasitic forms: Root-knot nematode, sugar-beet nematode, bulb and stem nematode, and strawberry nematode. The following control methods are being investigated: Crop rotation for the various nematode pests and its regional application; cultural control such as early planting, frequent cultivation, submersion, and fallowing; seeking and testing nematode-resistant crop plants and ornamentals; selecting resistant varieties of susceptible crops; testing chemical and other soil-disinfection methods; and developing therapeutical methods to cure infested plants by killing the nematodes without harming the plants through hot water, vapor heat, vacuum treatment, or chemical therapeutics (iodine, etc.).

To estimate the savings resulting from these activities is difficult. They touch home gardens as well as large-scale crop production and cover items such as these: A truck gardener is informed how to again grow healthy carrots instead of his knotted, unmarketable, root-knot-infested crop; a greenhouse man is told how his unmarketable, leafless begonias can be cured by controlling the strawberry nematode; a real-estate company is informed how by proper procedure they may avoid further losses to shade trees affected by nematodes in their city development. The yearly savings through the activities under this project amount certainly to more than ten times the amount of the whole appropriation.

(b) Investigations On Nemic Parasites of Insects and Other Invertebrates.--Activities under this project include the examination of and correspondence relating to some fifty to eighty sample collections of nematodes parasitic in lower animals, such as snails, earthworms, and insects (barkbeetles, Japanese beetle, mosquitoes, gypsy moth, grasshoppers, etc.) Such collections are submitted for information regarding the possible significance of the parasites as natural enemies of these pests. Investigations on the taxonomy, life history, and economic significance of the mermithids, forms known particularly as grasshopper parasites, are now being prepared for publication.

Colonization of mermithids to control grasshoppers in regions where outbreaks of this insect occur regularly as yet have not been successful. The results obtained through these investigations, however, are of great scientific value since they add a new page to our knowledge of how nature controls the ravages of insect and similar pests in certain regions.

Recent work proved the neoaplectanas, another group of nematodes, to be highly efficient disease agents of numerous economic insects. They attack the larval stages (soil phase) of such pests as the Japanese beetle, alfalfa weevil, fall army worm, spotted cutworm, house-fly larva, corn earworm, etc. Experiments are showing that these pathogenic forms may be raised in large numbers on artificial media for colonization purposes, and it is hoped that methods can be developed by which these parasites may be used as an efficient factor in the control of these pests.

(q) PLANT EXPLORATION AND INTRODUCTION

Appropriation Act, 1938	$204,483
Budget Estimate, 1939	200,933
Decrease	3,550

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Decrease
Plant exploration and introduction:				
(a) Plant exploration and collection.....	$54,590	$54,606	$51,056	- $3,550(1)
(b) Field testing of introduced plants.....	128,819	128,969	128,969	- - -
(c) Plant geography and bibliographic investigations...	19,876	20,908	20,908	- - -
Unobligated balance.....	1,198	- - -	- - -	- - -
Total appropriation.....	204,483	204,483	200,933	- 3,550

DECREASE

(1) The decrease of $3,550 in this item for 1939 will be met by curtailment of work under the project "Plant exploration and collection".

WORK UNDER THIS APPROPRIATION

General.--This Division serves as a cooperative and coordinating agency for securing from all parts of the world new, rare, and promising plants that may be useful in the development of new crop industries, directly for the diversification or expansion of economic needs, or as material to be used by plant breeders, especially as related to the development of disease and insect-resistant crops. Initial protection is provided against the introduction of foreign insects and diseases, and preliminary propagation and tests are conducted at four widely separated field stations. Cooperation is maintained with crop specialists in the U. S. Department of Agriculture, State agricultural colleges and experiment stations, botanic gardens, arboreta, nurserymen, and with selected lists of specially qualified private individuals. Studies are conducted of potential crop plants and of soil and climates of foreign countries as compared with this country, with a view to obtaining materials for introduction most adapted to our needs.

This Division is now generally recognized as the clearing house through which needed plant material is most effectively received. It is also recognized in this country and abroad as the most effective agency

in exchanging plant material with foreign research workers, and results obtained have been so effective that its organization and procedure have been studied by other countries as a basis for the establishment of similar organizations. Introductions obtained by exploration and through contacts built up with foreign research workers, nurserymen, botanists, explorers, and plantsmen, as well as our own consular officers and commercial and agricultural attaches, have developed into important crops having a high economic value in our domestic agriculture.

(a) Plant Exploration and Collection.--Foreign explorations are carried on by agricultural explorers for the purpose of receiving new and promising types of plants superior to those now grown in this country or having promise in aiding in the development of new crop industries and further advancing our agricultural and horticultural interests through breeding, development of disease-resistant crops, and meeting the changes in shifting economic needs, as well as contributing to such broad problems as erosion control, range improvement, and beautification of the home and its surroundings. As an adjunct to field operations, worldwide exploration work is carried on through correspondents and collaborators in foreign countries, having in view the same objects and purposes.

Since this work is carried on with a view to aiding agriculture in all parts of the country, it is widely regional. Important grain introductions include varieties of wheat, barley, rye, oats, rice, and grain sorghums which have become standard over wide areas of our grain-growing regions. Forage introductions of varieties of alfalfa, soybeans, lespedezas, grasses, and vetches include many which have become an indispensable part of our agriculture. One cotton variety, the Acala, has been developed into the single variety of importance around which the cotton industry of the Southwest largely centers. As a result of most recent explorations, potatoes, tobaccos, and a wide range of vegetables have been received for work in major breeding projects for other divisions of the Bureau of Plant Industry. While results in the field of horticulture are slower because of the long-time nature of most of the crops, certain introductions of citrus fruits, avocados, and nectarines have become commercially important crops and other introductions have been of material assistance to breeders in the development of new varieties and disease- and insect-resistant root stocks.

(b) Field Testing of Introduced Plants.--Experimenters' service activities under this appropriation include the widespread regional testing of all introduced plant material, with a view to determining its adaptability to the soils and climates of this country. This is accomplished by means of organized cooperation with crop specialists of the United States Department of Agriculture, State agricultural colleges and experiment stations, botanic gardens, and arboreta, together with selected lists of nurserymen and private individuals. Similar tests and experiments are carried on at four special plant-introduction gardens so located as to receive widespread regional effects of soil and climate.

This work is an essential part of plant introduction. Before extensive cultivation of introduced plants can be advised, reliable information must be obtained concerning their adaptability and their potential

value to American agriculture and horticulture. This information can be obtained only by means of widespread field tests. A vital activity of this service is to prevent the bringing in of new insect pests or diseases incident to the introduction of plant material. Special facilities for growing and propagating under quarantine and detention, under rigid control, are utilized for this purpose.

(c) Plant Geography and Bibliographical Investigations.--Studies are made of the relation of crop distribution to climatic and soil conditions and of the important problems of plant introduction from a geographical point of view for the purpose of locating foreign sources of potentially valuable crops and to insure that such crops, when introduced, will be provided with soil and climatic conditions suited to their needs. This work is essential to the development of a proper and intelligent background for plant introduction and the necessary testing work connected therewith. Its purpose is to chart the field in advance so that a minimum of time and effort will be lost in the search for new crops and the proper placing of these crops for experimental use. Unless adequate plans are made in advance through this project, much of the efficiency of the introduction procedure would be lost.

(r) PLANT NUTRITION

Appropriation Act, 1938	$16,024
Budget Estimate, 1939	16,024

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
Plant nutrition investigations, including effects of length of day on growth.....	$15,838	$16,024	$16,024
Unobligated balance.....	186	- - -	- - -
Total appropriation.....	16,024	16,024	16,024

WORK UNDER THIS APPROPRIATION

The great variation in influence of certain crops on both yield and quality of succeeding crops in the rotation system is particularly important. Plant nutrition investigations are directed toward the determination of the extent and significance of the influence of these variations, particularly on yield and quality of crops included in the rotation, and include the relative plant-food requirements of the crops in the rotation system. Laboratory and field investigations are conducted to determine which of the chemical elements are essential for normal plant

growth and the functions of these elements in the nutrition of the plant, with special reference to elements required only in very small quantities. Studies are also made of the effect of length of day on growth, development, and composition of plants, including effects of the daily duration, the intensity, and the color or composition of the light. The work is carried on with the same personnel as those engaged in Tobacco Investigations.

The practical importance of the cropping system on yield and quality of crops is illustrated by recent field trials in which a weed fallow preceding tobacco has consistently raised the market value of the tobacco crop from an average of $125 to approximately $375 per acre because of remarkable improvement in yield and especially in quality of the leaf. Other crops also may be greatly affected by the rotation system. The nutrition studies are demonstrating that for many important soils it is necessary to include in the fertilizer mixtures materials which will supply certain chemical elements not previously considered, such as magnesium, calcium, sulphur, and boron. These results have an important bearing on the correct use of the new highly concentrated fertilizer materials. Discovery of the remarkable effects of seasonal and latitudinal change in length of day on the growth and the flowering and fruiting of plants is being effectively applied to the production of seed of certain varieties of tobacco under short-day conditions in the South, while the crop of commercial leaf is grown in northern latitudes where seed can not be produced because of the long days. The principles are now being found to largely govern the northerly or southerly range of the different varieties and strains of various crop plants. They are also finding practical application in the commercial production of certain flowers, such as chrysanthemum, several weeks in advance of their normal season by shading to shorten the day length. This method of hastening and controlling time of flowering is being extensively used in the production of new varieties of crop plants by breeding.

(s) RUBBER AND OTHER TROPICAL PLANTS

Appropriation Act, 1938 . . . . . $46,749
Budget Estimate, 1939 46,749

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
Tropical economic plants, Investigations of:			
(a) Rubber production and breeding investigations....	$20,047	$20,049	$20,049
(b) Miscellaneous economic tropical crop studies, including coffee, cacao, coconut, papayas, oil palms, bananas and other minor crops of potential importance.....	26,397	26,700	26,700
Unobligated balance.....	305	- - -	- - -
Total appropriation.....	46,749	46,749	46,749

WORK UNDER THIS APPROPRIATION

Under this appropriation experiments are conducted bearing on the introduction into cultivation of foreign and native plants of potential value in the production of rubber and on the acclimatization and adaptation of various tropical crop plants to the warmer regions of the United States. Studies are conducted with such crop plants as cacao and coffee. Plantings are maintained in southern Florida, and selections are made of species and strains which are found to be adapted to the warmer sections of this country. Cooperative pollination studies are in progress to provide data for the development and special propagation of high-yielding clones of tropical rubber-producing species. Rubber investigations involve the study of both foreign and native plants containing rubber and the selection of high-yielding strains and experiments on methods of rubber extraction. Other plantings of non-tropical rubber-producing plants chiefly goldenrods, are maintained in Georgia, and studies are made of native and hybrid strains for the production of rubber of this type. Investigations of tropical plants are essential to the establishment of new crops and ornamentals in the South. Experiments and tests conducted at plant-introduction stations have resulted in the selection of a large number of tropical plants adapted to cultivation in the South, and other plants now being tested have shown promise of being valuable additions to south tropical horticulture.

Rubber investigations constitute the most important phase of tests now under way. Over half of the world's output of rubber is consumed in the United States. No other commodity which is not produced in commercial quantities inside our borders is of more importance in our American life. Not only do we produce no rubber in important quantity, but the source of 90 percent of our rubber is thousands of miles away in the East Indies and might be cut off entirely either by economic manipulation or military mischance, or the price might be raised so high by restrictive combinations of producing areas as to compel us to pay a high premium to foreign investors. In case of war, our very existence might depend on assurable supplies of rubber. Also, actual or potential production of rubber in the United States would act as a curb to check foreign combinations formed to increase the cost of rubber artificially.

(t) SEED INVESTIGATIONS

Appropriation Act, 1938	$72,293
Budget Estimate, 1939	72,293

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
1. Seed testing investigations....	$38,482	$39,054	$39,054
2. Federal Seed Act Enforcement...	27,301	32,989	32,989
3. International Seed Testing Congress, expenses to meet the share of the United States for the.....	250	250	250
Unobligated balance.....	1,260	- - -	- - -
Total appropriation.....	67,293	72,293	72,293

WORK UNDER THIS APPROPRIATION

General.--The Division of Seed Investigations protects the quality of seeds used in the United States through research and law enforcement.

1. Seed Testing Investigations.--The research work is planned to find means by which various crop and weed seeds similar in appearance may be separated and identified and to prepare descriptions and illustrations to make the work available to others; to determine the kinds of weed and other seeds which occur in agricultural seeds produced in different seed-producing areas of the world as an aid to determine the origin of particular lots of seed in relation to their adaptability for use in any given region; to study the physiology of seed germination and the procedure for testing seeds to indicate their plant-producing value, including those which require unusual treatment during the germination test; to determine the in-

fluence on the vitality of seeds of conditions of production and storage and of their movement from one climatic area to another having widely different humidity and temperature conditions; and to determine the length of time seeds will retain their vitality when buried in soil as related to weed distribution and weed eradication.

As a result of these functions, it is now possible to definitely separate and identify most of the agricultural grasses, the vetches, and many of the Brassicas, as well as many other crop and weed species, but extension of this type of knowledge is being carried on. A comprehensive study of the foreign seeds found in commercial seed of red clover and of alfalfa from various countries of the world is being prepared for publication.

Studies on the germination of seeds have dealt both with problems designed to advance our knowledge of the general principles of seed germination and with specific difficulties in the carrying out of tests of the viability of seeds. Methods have been developed to hasten germination of seeds of many groups of cultivated plants where germination has been found difficult. Continued emphasis has been placed on the primary importance of determining possible agricultural value when testing seeds for germination.

Results of the storage experiments, some of which are ready for publication, already have revealed facts that should be of service in both foreign and domestic trade in seeds. One buried-seed experiment has shown the ability of some seeds to remain for at least 30 years in the soil and then make vigorous plants. Another trial shows the ability of red rice to remain viable in rice fields for several years.

It is such knowledge, resulting from fundamental research, that has placed the sale of agricultural seeds on a definite basis and has made seed control possible.

Seeds are examined to determine their kind, adulteration, freedom from other crop seeds and weed seeds, plant-producing power, and region of production. These examinations are made for investigators in the U.S. Department of Agriculture, various Government purchasing agencies, State officials, farmers, and dealers in seeds. During the past year many tests have been conducted for various purchasing agencies of the Government and in connection with the cooperative research work of the Department of Agriculture.

Seeds to be exported are analyzed and certificates issued to exporters in compliance with the recommendations of the International Seed Testing Association.

2. Federal Seed Act Enforcement.--The import provisions of the Federal Seed Act regulate the quality of the more important forage-crop seeds imported into the United States and require the staining of all imported red clover and alfalfa seed to indicate the general unadaptability of imported alfalfa and red clover seed in comparison with adapted domestic strains. The interstate clause prohibits the interstate shipment of all seeds which are fraudulently misbranded.

Every lot of seed subject to the import provisions of the Federal Seed Act is sampled by the U. S. Customs Service, and all samples are tested by the Division of Seed Investigations of the Bureau of Plant Industry, and only those meeting the requirements of the Act are permitted entry. The coloring of imported seed of alfalfa and red clover as provided by the Federal Seed Act is also supervised by this Division. The result of the enforcement of the import provisions of the Act has been to keep out of the country seeds which are of low quality. The coloring provision of seed of alfalfa and red clover has resulted in the ability of the purchaser to know whether he is buying domestic or imported seed. This knowledge on the part of the purchaser led to a wide price differential between domestic seed and the 13,879,300 pounds of foreign red clover seed and 3,644,600 pounds of foreign alfalfa seed imported and stained under the provisions of the Federal Seed Act during the fiscal year 1937.

The interstate clause of the Federal Seed Act insures each State protection against shipment into the State of fraudulently misbranded seed of any kind, the States themselves not having authority to prevent such shipment. The enforcement of this clause of the Act has been carried on in cooperation with State authorities and has resulted in prosecutions for the shipment of misbranded seeds of oats, rye, vetch, soybeans, cowpeas, clover, alfalfa, sorghum, and other seeds on account of misbranding as to origin, variety, adulteration, percentage of pure seed, and germination.

Cooperative seed-testing laboratories are maintained at Sacramento, California; Corvallis, Oregon; Lafayette, Indiana; and Columbia, Missouri, to facilitate the work of the Division in seed testing and in Federal Seed Act enforcement.

3. International Seed Testing Congress.--Under this project participation in the work of the International Seed Testing Congress on the part of the United States is authorized and $250 annually is appropriated toward the expenses of the Congress. The Seed Testing Congress has set up international rules for testing seed to insure uniformity, and through cooperative effort is endeavoring to improve these rules, as well as other problems relating to international trade in seeds.

(u) SOIL-FERTILITY INVESTIGATIONS

Appropriation Act, 1938	$172,157
Budget Estimate, 1939	168,457
Decrease.	3,700

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Decrease
1. Soil-fertility investigations:				
(a) Citrus soil-fertility investigations.....	$8,800	$9,100	$8,650	- $450(1)
(b) Pecan soil-fertility investigations.....	19,455	20,000	19,300	- 700(1)
(c) Cotton soil-fertility investigations.....	6,750	6,700	6,700	- - -
(d) Potato soil-fertility investigations.....	8,600	8,700	8,700	- - -
(e) Sugarcane soil-fertility investigations.....	12,924	13,800	13,100	- 700(2)
(f) Sugar beet soil-fertility investigations.....	10,997	11,200	11,200	- - -
(g) Soil-fertility investigations on truck and miscellaneous crops....	9,940	9,500	9,500	- - -
(h) Soil improvement by crops and cropping methods, Investigations of.....	8,181	8,007	7,807	- 200(1)
(i) Biochemical soil-fertility investigations.....	46,662	47,100	46,835	- 265(1)
(j) Cotton root-rot soil and fertilizer investigations	33,365	38,050	36,665	- 1,385(1)
Unobligated balance.....	6,483			
Total appropriation.....	172,157	172,157	168,457	- 3,700

DECREASE

The decrease of $3,700 in this item for 1939 consists of:

(1) A reduction of $3,000 through curtailment of work under projects 1-a, 1-b, 1-h, 1-i, and 1-j.

(2) A reduction of $700 in rental charges at Houma, Louisiana. (Project 1-e), due to construction of a department-owned laboratory at that point.

WORK UNDER THIS APPROPRIATION

General.--Work under this appropriation consists of studies of soil fertility and fertilizer problems to develop economical practices which will enable the farmer to reduce his cost of production and obtain crops of better quality. The work involves determining the fertilizer requirements of different soil types for different crops and the influence of fertilizer elements on the growth, maturity, yield, quality, and disease resistance of crops; biochemical soil and fertilizer studies on the relation of organic matter, green manure, and crop residues to soil fertility; cotton root-rot soil and fertilizer studies; and soil-improvement investigations in the sandhill section of the South. Knowledge of inherent soil fertility and the relative adaptability of specific soil types to specific crops and knowledge of the particular fertilizer required to supplement natural soil fertility for certain crops are important factors in reducing cost of crop production. Moreover, every acre of crop soil is subject to depreciation and decreased efficiency if proper methods of soil fertility maintenance are not followed--a factor in conservation of invested capital as well as in cost of production.

Soil-Fertility Investigations.--Under this project the fertilizer requirements of the principal soil types and agricultural regions are being determined for a number of important crops, including cotton, sugarcane, sugar beets, potatoes, truck crops, citrus and other subtropical fruits, pecans, and green-manure crops. The most suitable fertilizer ratios, the most desirable kind and amount of each fertilizer ingredient to use, and the most economical rate of application are determined. The economic value of using more concentrated fertilizer in crop production and the placement of fertilizer to secure maximum results in stand and yield are investigated under practical farm conditions. Field and laboratory studies are prosecuted to determine the influence of fertilizers and soil characteristics, correlating these with prevalence of root-rot in cotton, determining the chemical and physical difference between infested and noninfested soils, and the influence of cultural methods and crop rotations in conjunction with the use of fertilizers in the control of root-rot, with the object of reducing losses from this soil-borne disease in over 9,000,000 acres of otherwise good cotton land in Southwestern States. The work involves the establishment of field experiments on prominent soil types in cooperation with State experiment stations and leading farmers. Biochemical soil and fertilizer studies are made on the nature, quantity, and distribution of organic compounds in soils and their effect on biological activity, on the changes brought about in soil constituents by growing plants, and on changes which fertilizer salts undergo in soils and their effects on plants, which researches are of fundamental importance in developing sound fertilizer usage. Soil-fertility investigations are designed to enable the farmer with the least possible outlay to obtain the greatest net return for his work through reduction of unit cost and meeting the demands for better quality products.

Field laboratories are located at Houma and Shreveport, La.; Orlando, Fla.; Albany, Ga.; Columbia, S.C.; Chadbourn, N.C.; Austin, Texas, Scottsbluff, Nebr.; and Davis, Calif.; and field experiments are conducted in

those States and in Maine, New York, New Jersey, Virginia, Pennsylvania, Ohio, Michigan, Montana, Idaho, Colorado, and Utah.

(v) SOIL MICROBIOLOGY INVESTIGATIONS

Appropriation Act, 1938 . . . . . $39,854
Budget Estimate, 1939 39,854

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)
Soil microbiology investigations:			
(a) Soil inoculation investigations and inspection of cultures.....	$19,000	$19,000	$19,000
(b) Soil population investigations in relation to crop production, bearing primarily on fungi, bacteria, algae, etc.....	20,298	20,854	20,854
Unobligated balance.....	556	- - -	- - -
Total appropriation.....	39,854	39,854	39,854

WORK UNDER THIS APPROPRIATION

General.--The purpose of this appropriation is to inspect and test commercial cultures of legume nodule bacteria, including researches upon legume inoculation, and for researches upon microorganisms in the soil, their activities, and relationships to crop production.

(a) Soil Inoculation Investigations and Inspection of Cultures.--Work under this project includes inspection and testing of commercial cultures of legume nodule bacteria and of soil inoculants to insure that cultures sold to farmers are true to type, viable, and efficient for the purpose claimed. Research is also conducted on legume nodule bacteria in connection with the efficiency of strains, influences which alter their quality or interfere with their functions, methods of practical application, and the development of special strains for all legume crops, including those newly introduced into this country. Since the proper nitrogen-fixing bacteria must be applied to legume seed wherever the growing of a particular crop is extended into a new area, a tested collection of strains is maintained to aid in the establishment of new crops in cooperation with State experiment stations, county agents, and individual farmers.

(b) Soil Population Investigations in Relation to Crop Production, Bearing Primarily on Fungi, Bacteria, Algae, etc.--Work on this project covers studies on the decomposition of cellulose and crop residues; the effect of soil reactions and soil treatments on the microorganisms and their activity in the soil; studies of the organisms responsible for the decay of soil organic matter; and studies on the slime molds and their functions in soil. These investigations are planned to obtain a better understanding of the nitrogen transformation and economy of the soil and the relation of its micropopulation to different manuring, cropping systems, and other treatments, with the view to increasing the efficiency of farm practices.

(w) SUGAR-PLANT INVESTIGATIONS

Appropriation Act, 1938	$428,700
Budget Estimate, 1939	322,500
Decrease.	106,200

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Decrease
1. Sugar beet investigations:				
(a) Sugar-beet leaf-spot and root-rot control investigations.....	$34,089	$34,600	$33,713	- $887(1)
(b) Sugar-beet curly-top control investigations, including breeding and other means.....	97,399	97,990	96,063	- 1,927(1)
(c) Sugar-beet production and breeding investigations	74,818	75,818	75,018	- 800(1)
Total, Sugar beet investigations.....	206,306	208,408	204,794	- 3,614

PROJECT STATEMENT - Continued

Projects	1937	1938 (Estimated)	1939 (Estimated)	Decrease
2. Sugarcane investigations:				
(a) Sugarcane cultural investigations.....	$31,266	$31,595	$30,535	- $1,060(1)(2)
(b) Sugarcane disease investigations.....	30,777	31,277	30,917	- 360(1)
(c) Sugarcane breeding investigations.....	33,469	50,068	49,118	- 950(1)
(d) Sugarcane deterioration in storage, Investigations of.....	7,352	7,352	7,136	- 216(1)
(e) Purchase of land and construction and equipment of sugar laboratory at Houma, Louisiana.....	- - -	100,000	- - -	-100,000(3)
Total, Sugarcane investigations.....	102,864	220,292	117,706	-102,586
Unobligated balance.....	2,909	- - -	- - -	- - -
Total appropriation.....	312,079	428,700	322,500	-106,200

DECREASE

The decrease of $106,200 in this item for 1939 consists of:

(1) A reduction of $5,700 through curtailment of work under projects 1-a, 1-b, 1-c, 2-a ($560), 2-b, 2-c, and 2-d.

(2) A reduction of $500 in rental charges at Houma, Louisiana (Project 2-a), due to the construction of a department owned laboratory at that point.

(3) A reduction of $100,000 under Project 2-e, a non-recurring increase provided in 1938 for construction of a sugar laboratory at Houma, Louisiana.

CHANGES IN LANGUAGE

It is proposed to amend the language of this paragraph (1) by eliminating the clause making $100,000 immediately available (including $12,500 for purchase of land) for a sugar laboratory at Houma, Louisiana; and (2) by striking out the proviso removing the $2,500 general limitation on the cost of farm buildings, under this item in 1938.

WORK UNDER THIS APPROPRIATION

General.--The work under this appropriation consists chiefly of research on the problems connected with the growing of sugar beets, the production of sugar-beet seed, and the growing of sugarcane in continental United States, including the control of diseases affecting these crops. The purpose of the work is to safeguard the sugar-beet and sugarcane industries against losses resulting from diseases and from other controllable hazards and, by breeding and introducing disease-resistant varieties of sugar beets and sugarcane, by developing other means for the control of diseases, and by solving other agricultural problems of the industries, to stabilize production and, by insuring fairly definite yield expectations regardless of disease-inducing weather variations, to further increase the level of profitability of producing these crops. Results of research pertaining to sugarcane are also of important value to the sugarcane industry in Puerto Rico, Hawaii, and the Virgin Islands.

1. Sugar Beet Investigations.--Under this project superior yielding varieties of sugar beets are being developed, strains resistant to disease are selected for increase, types better adapted to conditions in this country are produced, experiments involving comparative studies of cultural practices are performed, and special methods for the control of curly-top and other serious diseases, including special investigations in cooperation with the Bureau of Entomology and Plant Quarantine for the control of the curly-top disease of sugar beets transmitted by the leafhopper, are being studied. The sugar-beet industry is particularly interested in the investigations on field methods of controlling diseases and in the increase of seed supplies of disease-resistant sugar beets.

Sugar production from beets in the continental United States has, by recent enactment, been stabilized at 1,550,000 tons. Approximately 1,000,000 acres in 18 States are used for beet growing, and in these States the beet is an important element in the cropping system. The capital investment in farm lands, farm equipment, irrigation systems, factories, factory equipment, and transportation and power facilities directly concerned in sugar-beet production and beet-sugar manufacture may be conservatively placed at $350,000,000. The capital investment in important subsidiary industries furnishing supplies and service to the beet industry and in the livestock industry directly concerned in utilizing sugar-beet by-products as feed would greatly increase this figure. For the 1936 crop, the fabricated products -- beet pulp, molasses, and refined sugar -- had a value in excess of $127,000,000, and the sugar beets were worth, on the farm, $56,000,000. The sugar beet, in good years, has been a profitable crop for the farmer to grow. It should be even more favorably considered with a parity price to be paid farmers for sugar beets. The crop, however, because of ravages of diseases, improper cropping practices, and soil depletion, has been an extremely hazardous one in many regions. A truly stabilized and safe beet agriculture can be secured only when the enormous losses to farmer and factory arising from disease epidemics and from inefficient crop practices are removed by the findings and application of agricultural research. Gratifying progress in the development of strains of sugar beets resistant to curly-top and leaf-spot (the principal diseases of beets) has been made.

Two strains resistant in a measure to curly-top have been released for commercial culture and were extensively used in the 1936 and 1937 plantings in the Western States. Several varieties markedly improved in resistance to leafspot are now being increased for commercial test in the areas affected by that disease. Strains of greater promise are in process of development and test, forecasting the eventual removal of these disease hazards, which take a toll of many millions of dollars every year and threaten the existence of a large proportion of the beet-growing industry, with capital investments of over fifty million dollars. Successful fruition of work on disease-resistant strains of sugar beets has brought into existence a new industry for American farmers -- the commercial production of sugar-beet seed -- the beginning of which, attributable entirely to this research, was started on a substantial basis in 1933, and in 1936 produced approximately 40 percent of the domestic seed requirements. This seed enterprise, if work be actively continued, will free American beet growers from the anomalous but traditional dependence on European seed supplies, a situation which, because of higher cost of imported seed, tends to increase cost of producing beets. (The California, New Mexico, Colorado, Minnesota, and Michigan Agricultural Experiment Stations, the Division of Soil-Fertility Investigations of the Bureau of Plant Industry, the Carbohydrate Research Division of the Bureau of Chemistry and Soils, and the Division of Mechanical Equipment of the Bureau of Agricultural Engineering are cooperating in this work.)

Field stations and laboratories are maintained at the following points: Twin Falls, Idaho; Riverside, California; Fort Collins, Colorado; Salt Lake City, Utah; and Rocky Ford, Colorado. Field experiments are also conducted at stations at Davis, California; Las Cruces, New Mexico; Scottsbluff, Nebraska; St. Paul, Minnesota; East Lansing, Michigan; and Arlington Farm, Virginia.

2. Sugarcane Investigations.--These investigations include the study of sugarcane diseases, development of disease-control methods, and the breeding and testing of new varieties of cane to secure disease-resistant, higher-yielding commercial varieties better adapted to natural climatic and soil conditions. The sugarcane industry is particularly interested in the investigations on field methods of controlling diseases, the continued development of disease-resistant varieties looking toward minimizing the fluctuations in production due to recurring disease hazards, and in the increase and distribution of seed supplies of the improved varieties as they are developed.

The project directly serves cane producers in eight States and Puerto Rico, who utilize about 490,000 acres of land for sugar production and more than 100,000 acres for sirup production. The welfare of approximately 1,000,000 people living in these cane-producing areas is directly or indirectly dependent upon the crop. About $330,000,000 are invested in land, transportation, and milling equipment, implements, etc. Incidental service features of the activities in this project are extended to the sugar industry of the Territory of Hawaii, which has capital investments of about $175,000,000. Outstanding progress has resulted from this work, the most striking example being the reconstitution of the Louisiana sugarcane industry by means of disease-resistant varieties of cane. The five-year

average production of sugar reflecting the per acre yield of cane during the period 1924-28 dropped because of a recently introduced virus disease to 95,400 tons per year, compared with an average of 280,000 tons for the previous 20 years and a maximum in any one year of nearly 400,000 tons. Restoration to an average of approximately 275,000 tons per year for the period 1932-36 is directly attributable to this research and, given reasonable encouragement and protection, the outlook for complete restoration and effective safeguarding of this important industry and of the cane-sirup industry in the Southern States in which sugarcane is grown seems dependent only on intensive prosecution of work under this appropriation. Farm value in 1936 of sugarcane grown for sugar production and of cane sirup produced in Louisiana alone was in excess of $20,000,000. (The Puerto Rico, Louisiana, and Mississippi Agricultural Experiment Stations are cooperating in this work.)

Field stations and laboratories are maintained at the following points: Canal Point, Florida; Houma, Louisiana, Cairo, Georgia; Guayama, Puerto Rico; Meridian, Mississippi, and Arlington Farm, Virginia.

(x) TOBACCO INVESTIGATIONS

Appropriation Act, 1938	$137,744
Budget Estimate, 1939	135,544
Decrease.	2,200

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Decrease
Tobacco investigations:				
(a) Cigar binder and filler production investigations.	$5,352	$5,717	$5,717	- - -
(b) Flue-cured tobacco production investigations.....	25,109	28,712	28,312	- $400(1)
(c) Burley tobacco production investigations.....	7,855	9,435	9,235	- 200(1)
(d) Maryland tobacco production investigations.....	6,357	6,360	6,360	- - -
(e) Dark air-cured tobacco production investigations....	2,235	2,400	2,400	- - -
(f) Tobacco disease investigations.....	53,146	52,302	51,402	- 900(1)
(g) Breeding and growing high nicotine tobacco for use in insecticides.....	10,688	10,250	10,050	- 200(1)
(h) Tobacco breeding and physiological investigations....	23,045	22,568	22,068	- 500(1)
Unobligated balance.....	3,957	- - -	- - -	- - -
Total appropriation.....	137,744	137,744	135,544	- 2,200

DECREASE

(1) The decrease of $2,200 in this item for 1939 will be met by curtailment of the work under the projects indicated in the foregoing.

WORK UNDER THIS APPROPRIATION

Tobacco investigations include all phases of growing, curing, and handling tobacco, with the exception of tobacco insects and their control and tobacco marketing. The work consists of studies on tobacco diseases and their control, laboratory research on causes of poor quality in leaf tobacco, and field investigations in the improvement of tobacco varieties and methods of fertilization, growing, curing, and handling the different types of leaf, as each distinctive type of tobacco presents special cultural problems. Development by breeding of milder types of leaf having a reduced content of nicotine is a feature of the work, as are also the development of high nicotine tobaccos for use as raw material in the production of insecticide and the determination of the best cultural methods for maximum production of nicotine. The primary aims are to increase the average quality of the tobacco produced and to reduce the hazards and heavy losses encountered in the culture of the crop. Cooperative experiments are carried on at the agricultural experiment stations of tobacco-growing States, namely, Connecticut, Georgia, Maryland, Massachusetts, North Carolina, Pennsylvania, South Carolina, Tennessee, Virginia, West Virginia, and Wisconsin, but no independent field stations are maintained.

Correct methods of fertilization are of outstanding importance in producing high-quality tobacco, and recent changes and trends in the production and use of fertilizer materials have created urgent need for information as to the adequacy and limitations of the newer materials in the fertilization of the different types of tobacco. Results already obtained concerning the necessity for supplementing the highly concentrated fertilizer materials with magnesium and certain other elements have strongly emphasized the importance of these problems, and the necessary information can be obtained only through extensive field and laboratory studies. It is essential also that cropping systems best suited to the production of leaf of high quality be determined. Due to the appearance of new diseases and the spread of older troubles, tobacco growers are suffering steadily increasing losses. The new blue mould or downy mildew constitutes a grave hazard over the greater portion of the tobacco-producing area, and, while much progress has been made in the development of control measures, further work is required, particularly on spray and gas treatments. In the Burley areas, in which 500,000 acres of tobacco are grown, most growers suffer damage from the black root-rot disease. In 1933 hundreds of acres of tobacco in Pennsylvania were practically ruined by the wildfire disease. Mosaic disease is widely prevalent in Maryland and other producing areas. Although definite progress has been made in developing control measures, much additional work is required, especially on some of the newer disease problems. Increase in the available supply of nicotine for insecticidal purposes at reasonable cost appears to be a matter of special importance at the present time, especially in connection with the spray-residue problem. There is urgent need for improvement in present methods of curing to eliminate serious losses incurred with Burley and other air-cured types.

(y) WESTERN IRRIGATION AGRICULTURE

Appropriation Act, 1938	$122,527
Budget Estimate, 1939	120,327
Decrease.	2,200

PROJECT STATEMENT

Projects	1937	1938 (Estimated)	1939 (Estimated)	Decrease
1. Crop production investigations on irrigation projects.....	$89,854	$90,730	$89,730	- $1,000(1)
2. Quality of irrigation and drainage waters, Investigations of.....	31,620	31,797	30,597	- 1,200(1)
Unobligated balance.....	1,053	- - -	- - -	- - -
Total appropriation.....	122,527	122,527	120,327	- 2,200

DECREASE

(1) The reduction of $2,200 in this item for 1939 will be met by curtailment of work, as indicated in the above Project Statement.

WORK UNDER THIS APPROPRIATION

General.--Under this appropriation the Bureau of Plant Industry is conducting investigations, independently and in cooperation with the States and with other bureaus of the Government, in the irrigated areas of the western United States to determine what crops and what crop rotations are best suited to the several regions, what constituents and concentrations of salts in irrigation and subsoil waters are injurious to crops, and how such injury may be minimized or prevented. The work of the Division is conducted under two projects, as follows:

1. Crop Production Investigations on Irrigation Projects.--The work under this project is prosecuted at seven field stations. Six of these are conducted in cooperation with the States of Nevada, Oregon, Washington, Montana, South Dakota, and Nebraska. The work at these field stations consists of tests of varieties of field crops, an extensive and long-continued series of crop rotations, experiments in pasturing crops with livestock, and experiments in the use of manures and fertilizers. The fundamental objective of all these experiments is to determine what crops and what methods of crop production and utilization are best adapted to the respective areas and will best maintain the productivity of the irrigated lands. The field stations operated on the irrigated lands serve cooperating divisions of the Bureau of Plant Industry, as well as divisions of other Federal bureaus and research and demonstration agencies supported by the States. (Bureaus of Animal Industry, Dairy Industry, and Agricultural Engineering cooperating).

2. Quality of Irrigation and Drainage Waters.--The work under this project is conducted at two field laboratories--one at Riverside, California, and one at Fallon, Nevada. It is cooperative with the States of California and Nevada, with the Bureau of Reclamation, the Geological Survey, the International Boundary Commission (United States and Mexico), and with various irrigation districts. The investigational work consists of collecting and analyzing samples of irrigation, drainage, and underground waters to determine what constituents and what concentrations of these constituents are causing crop injury or impairing the physical condition of the soil, to determine the sources of the contamination of irrigation supplies with such highly injurious substances as the compounds of boron and chlorine, and to devise means for minimizing or preventing such contamination. The fundamental objective of these investigations is to protect and maintain the productivity of irrigated lands.

EMERGENCY FUNDS

	Obligated, 1937	Estimated obligations, 1938
Public Works Allotment (National Industrial Recovery Act): Construction of artesian well, South Dakota (completion of work begun 1934).....	$19,022	$978

PASSENGER-CARRYING VEHICLES

The work of the Bureau of Plant Industry is necessarily, to a very large extent, in the country where transportation through the use of automobiles is essential to effective work. The authorization for the purchase of passenger-carrying vehicles for the Bureau of Plant Industry contemplates a reduction of $4,325 ($19,575 in 1938, $15,250 estimated for 1939). The estimate for 1939 will permit the needed replacement of 23 vehicles at a net average of $578 each when exchange allowances are taken into account, and the purchase of 3 additional vehicles, at an average cost of $673 each. These 3 cars are needed to carry on increased activities under projects already under way and those newly developed, and will be used by the following Divisions at the locations specified:

FOREST PATHOLOGY -- 2

1 car to be used by associate pathologist and assistants at Arlington Farm, Virginia and nearby states in connection with investigations on forest chestnut disease work; and 1 car to be used by senior pathologist and assistants at Morristown, New Jersey, in connection with pathological investigations on Dutch Elm Disease.

SUGAR-PLANT INVESTIGATIONS -- 1

This car to be used at Guayama, Puerto Rico by assistant agronomist, also to convey employees and officials from station to experimental plots, and to carry delicate instruments for field use.

BOUND BY